VHS

NEW TECHNICAL THEORY FOR SERVICING

SLV-X50PS/X50ME

OPERATION MANUAL

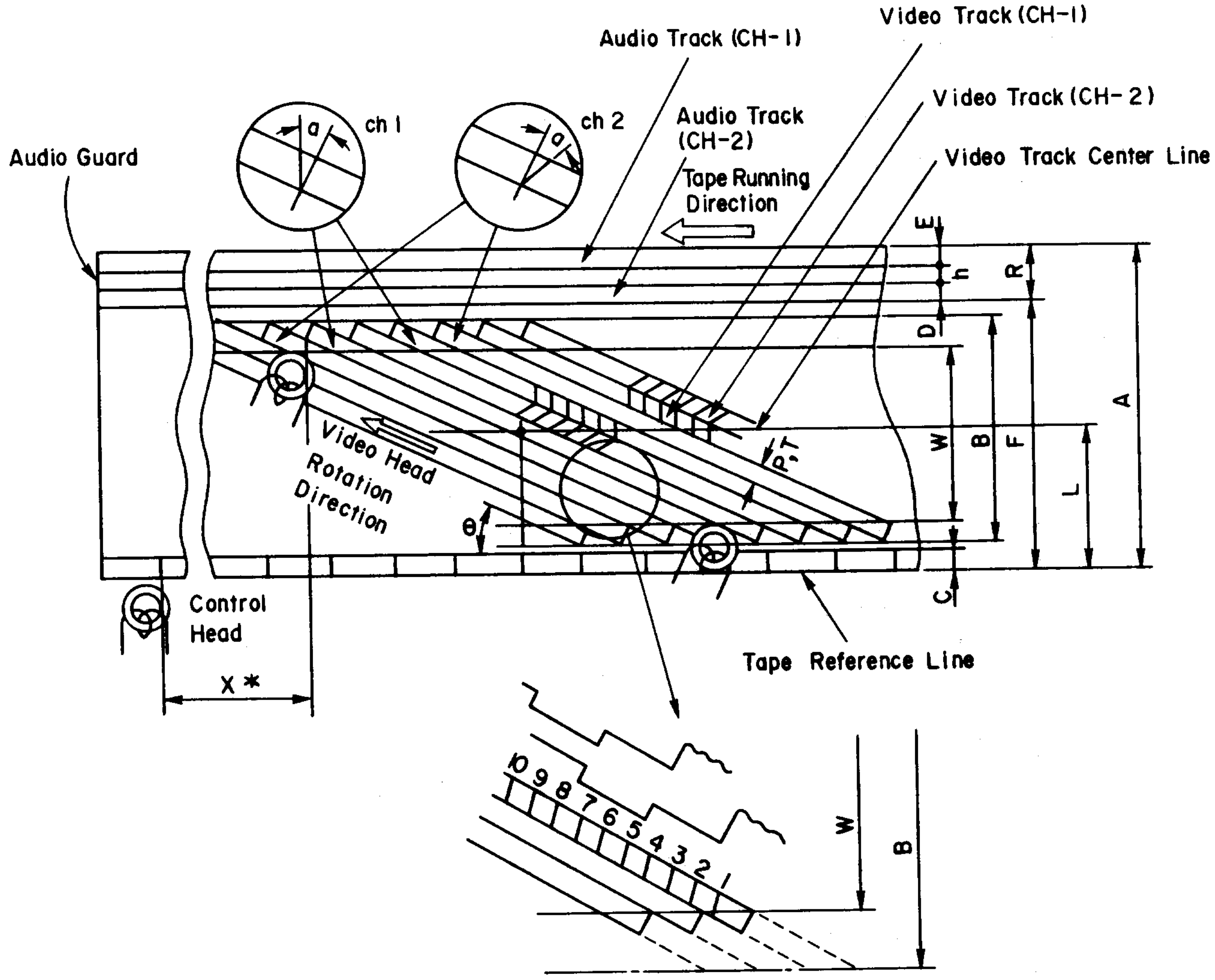
VHS VIDEO CASSETTE RECORDER

SONY®

SECTION 1. VHS PAL FORMAT AND ME SECAM SYSTEM

1-1. Tape Pattern

The tape format of the VHS-PAL system is shown in Fig. 1-1.


Video Track (CH-1)
Audio Track (CH-1)
Video Track (CH-2)
Audio Track (CH-2)
Video Track Center Line
Audio Guard
ch 1
ch 2
α
Tape Running Direction
E
h
R
D
A
W
B
F
L
T
P
Video Head Rotation Direction
θ
C
Control Head
Tape Reference Line
X *
10 9 8 7 6 5 4 3 2 1
W
B

* Distance on tape pattern between CH-2 video track 180° exit and CTL signal pulse

Fig. 1-1. VHS-PAL Tape Format

1-2. THE VIDEO SIGNAL RECORDING SYSTEM (PAL AND ME SECAM SYSTEM)

1-2-1. Video Recording Systems

- Luminance signal recording: FM recording
- Color carrier signal:

  PAL: Low-frequency conversion with phase shifting and direct recording

  ME SECAM: Low-frequency conversion direct recording

1-2-2. Recording Signal

CCIR monochrome, PAL and SECAM color TV signals

1-2-3. Video Signal Recording Frequency Range

- Monochrome luminance signal: 30Hz to 4.2MHz
- Composite luminance: 30Hz to 3.0MHz

1-2-4. Preemphasis Characteristics

$$\left.\begin{array}{l}\text{T: } 1.3 \pm 0.005\mu\text{sec} \\ \text{X: } 4 \pm 0.3\end{array}\right\} \text{slope}$$

1-2-5. FM Carrier Frequency

WHITE PEAK 4.8 ±0.1MHz
SYNC TIP 3.8 ±0.1MHz

1-2-6. FM carrier Frequency Deviation

1 ±0.1MHz

WHITE CLIP level: 160^{+10}_{-5} % from SYNC TIP

DARK CLIP level: 40 ± 10% from SYNC TIP

(Between SYNC TIP and WHITE PEAK is considered as 100%)

1-2-7. Recording Current Characteristics

FM signal recording amplifier characteristics: Saturated optimal recording current at frequencies 3.8MHz or more.

At currents of 2 and 1MHz, 3dB ±1dB and 6dB ±1.5dB assuming a current of 3.8MHz to be 0dB. Near flat characteristics for 1MHz or less.

Conversion carrier chroma signal band: Constant current characteristic

1-2-8. FM Signal Head Current

±1.5dB or less of optimal recording current of 4MHz

1-2-9. Chroma carrier Sgnal Conversion Frequency

- PAL: $f_c = (40 + 1/8)f_h$ (626.953Hz)

f_h is horizontal SYNC frequency of input video signal

- ME SECAM;

  $f_{CR} = (40 + 1/8)f_h + f_O - f_R$ (654.322kHz)
  $f_{CB} = (40 + 1/8)f_h + f_O - f_B$ (810.572kHz)
  $f_O = 4.433619\text{kHz}$
  $f_R = 4.40625\text{kHz}$
  $f_B = 4.25\text{kHz}$

1-3. THE CHROMA CARRIER SIGNAL CONVERSION FOR RECORDING

(Applicable to PAL only)

CH-1 (Head azimuth 6° clockwise) Constant and non-varying

CH-2 (Head azimuth 6° counterclockwise) Delayed 90° per horizontal period

The recording carrier chroma signal is phase-switched for each line in a position equal to the horizontal SYNC signal period or to the front porch without disturbing the burst phase.

1-3-1. The Chroma Carrier Signal Conversion Recording Level

–7 to –10dB from saturation (at PB output level)

1-3-2. Time Delay between Luminance (Y) and Converted Carrier Chroma Signals

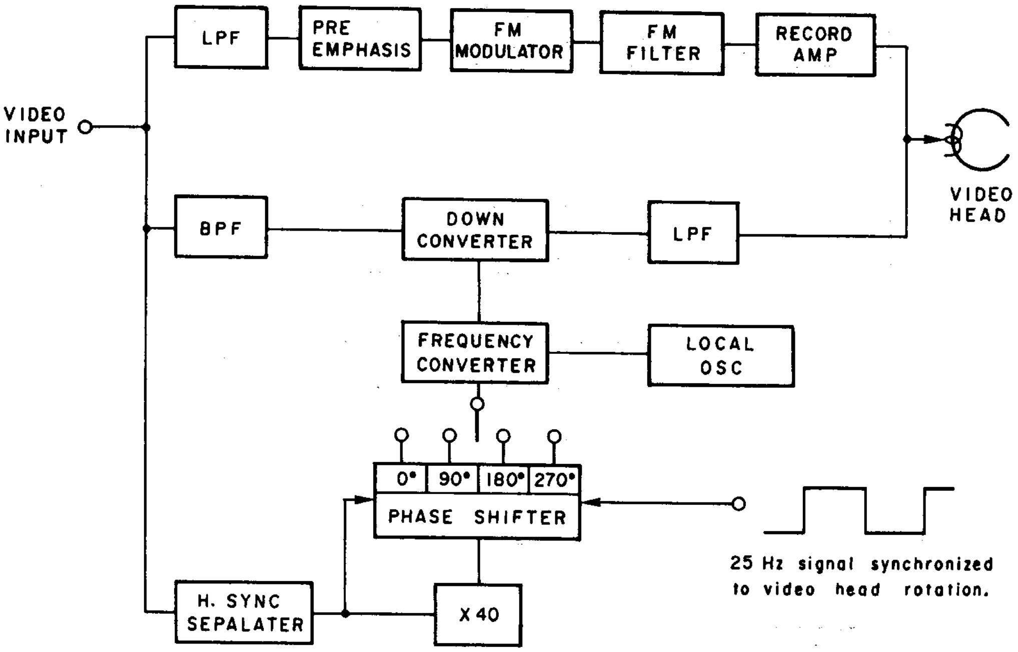
0.1μsec or less on video tape

1-3-3. Video Head response should be identical for the two channels.

VHS-PAL Specifications

No.	Symbol	Item	Unit	Standard	Remarks
1	(A)	Tape width	mm	12.65±0.01	
2	(Vt)	Tape feed speed	mm/sec	23.39±0.5% (SP)	
3	(ϕ)	Drum diameter	mm	62±0.01	Upper drum
4	(Vh)	Relative speed	m/sec	4.85	
5	(P)	Video track pitch	mm	0.049	
6	(B)	Total video width	mm	10.60	
7	(W)	Video width	mm	10.07	
8	(L)	Video track centre	mm	6.2	From tape reference edge
9	(T)	Video track width	mm	0.049	
10	(C)	Control track width	mm	0.75±0.1	
11	(R)	Audio track width	mm	1.0±0.1	Single track
12	(D)	Audio track width	mm	0.35±0.05	CH-2 (R)
13	(E)	Audio track width	mm	0.35±0.05	CH-1 (L)
14	(F)	Audio track reference edge	mm	11.65±0.05	From tape reference edge
15	(h)	Audio guard width	mm	0.3±0.05	
16	($\theta 0$)	Video track angle		5°56′7.4"	During tape stop
17	(θ)	Video track angle		5°57′50.3"	During tape run
18	(α)	Video head azimuth angle		±6° (±10′)	
19	(χ)	Audio and control head position	mm	79.244	
20		Position of V-SYNC		5 ~ 8H	

1-4. BASIC BLOCK DIAGRAM OF THE PAL Recording System



VIDEO INPUT
LPF
PRE EMPHASIS
FM MODULATOR
FM FILTER
RECORD AMP
VIDEO HEAD
BPF
DOWN CONVERTER
LPF
FREQUENCY CONVERTER
LOCAL OSC
0°
90°
180°
270°
PHASE SHIFTER
H. SYNC SEPALATER
X 40
25 Hz signal synchronized to video head rotation.

Fig. 1-2

1-5. THE RECORDINGSIGNAL SPECTRUM (PAL)

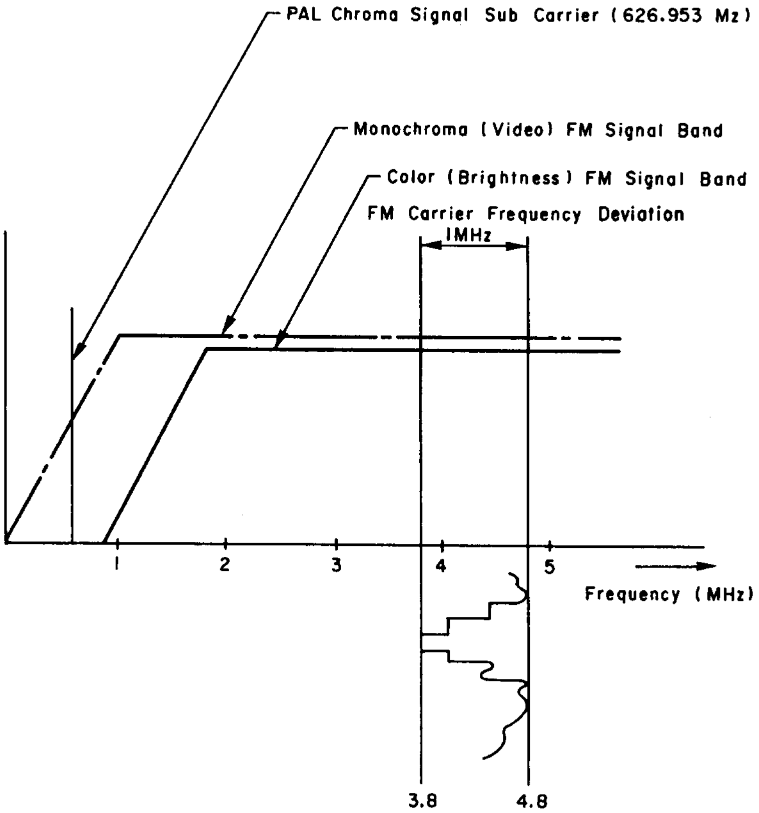


Fig. 1-3

1-6. BASIC BLOCK DIAGRAM OF THE ME SECAM

Recording System

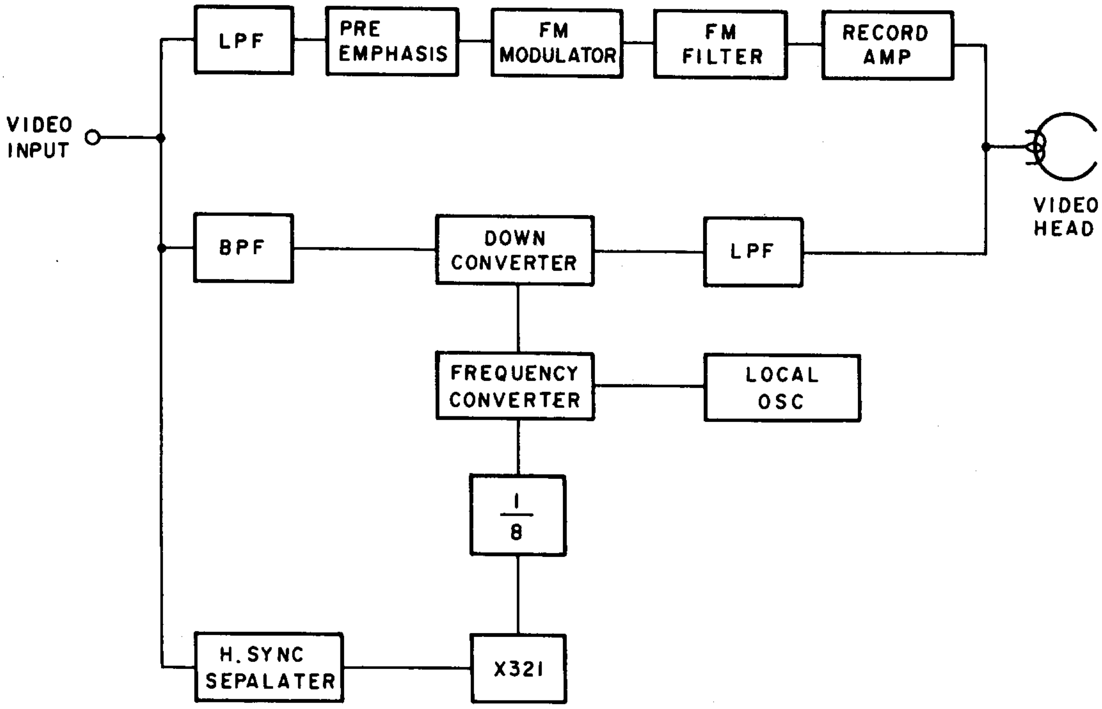
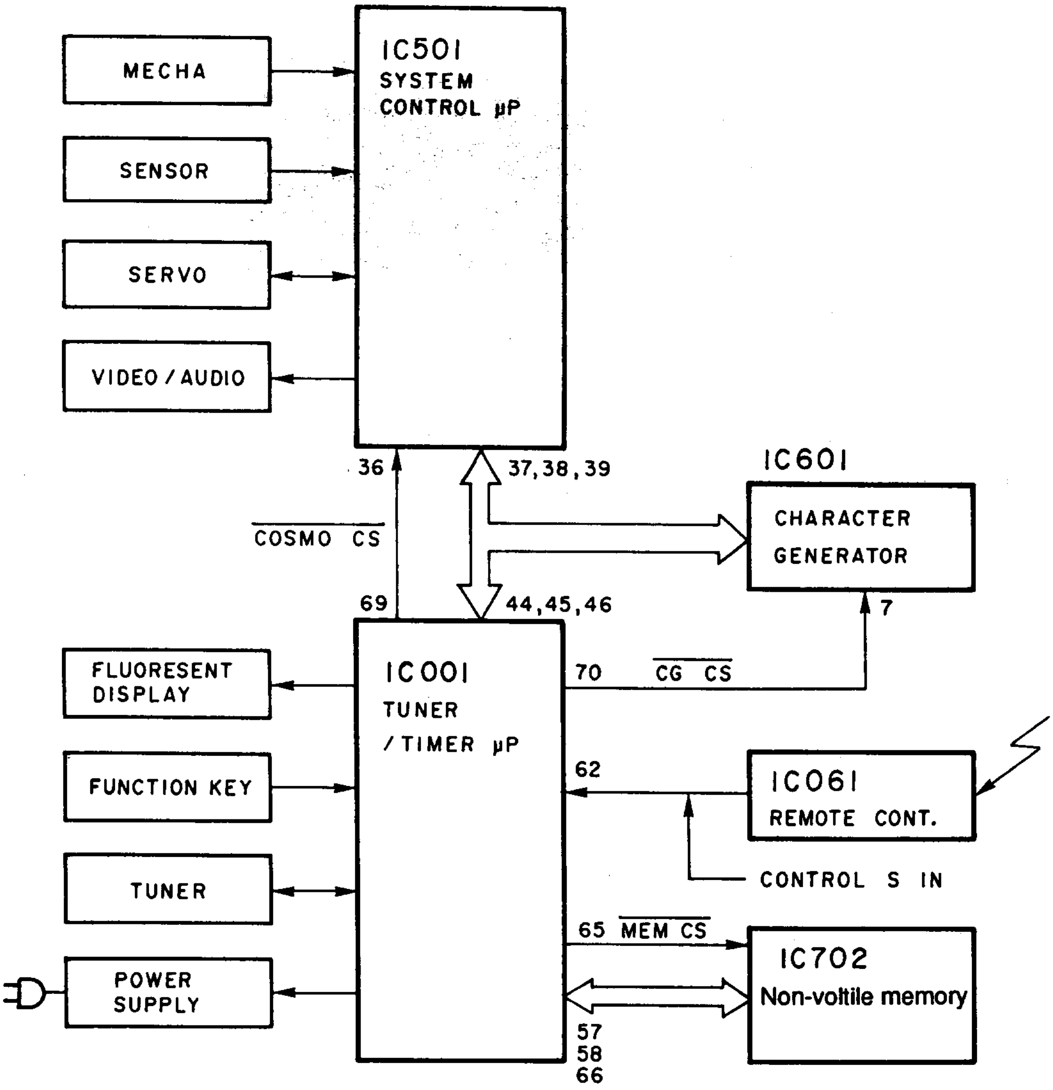

VIDEO INPUT
LPF
PRE EMPHASIS
FM MODULATOR
FM FILTER
RECORD AMP
VIDEO HEAD
BPF
DOWN CONVERTER
LPF
FREQUENCY CONVERTER
LOCAL OSC
1/8
H. SYNC SEPALATER
X321

Fig. 1-4

SECTION 2. SYSTEM CONTROL CIRCUIT

GENERAL

The system control circuit is composed of system control µP (IC501: CXP80116) and timer/tuner µP (IC001: CXP50116-M2).



MECHA
SENSOR
SERVO
VIDEO / AUDIO
IC501
SYSTEM
CONTROL µP
36
37,38,39
COSMO CS
69
44,45,46
IC601
CHARACTER
GENERATOR
7
FLUORESENT DISPLAY
FUNCTION KEY
TUNER
POWER SUPPLY
IC001
TUNER
/TIMER µP
70
CG CS
62
IC061
REMOTE CONT.
CONTROL S IN
65
MEM CS
IC702
Non-voltile memory
57
58
66

Fig. 2-1

IC501 is an 8-bit microcomputer having 16k byte memory and 2-channel (CH-1, CH-2) serial communication bus. It incorporates its own built-in servo functions.
IC501 is used to control the mechanical system, video/servo/audio circuits.

IC001 is a microcomputer with functions of controlling LINCS communication, SIRCS communication, character generator, and fluorescent display tube.
Communications between microcomputers are performed by time division system where $\overline{CS}$ (chip select) signal is executed in "L" time.

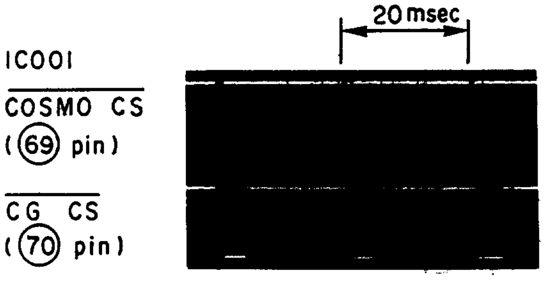


Fig. 2-2

The timing of selecting these CS signals is controlled by the tuner/timer µP (IC001).

IC702 is a non-voltile memory to store the data of stations selected by the tuner being controlled by the T/T µP.

2-1. FUNCTIONS OF µP TERMINALS

[IC501: CXP 80116]

<table>
<tr><th>Pin No.</th><th>Signal</th><th>I/O</th><th>Function</th></tr>
<tr><td>1</td><td>$\overline{\text{V.PB}}$</td><td>O</td><td>Video circuit REC/PB select signal. PB: L</td></tr>
<tr><td>2</td><td>$\overline{\text{JOG}}$</td><td>O</td><td>Video circuit NORMAL PB/JOG PB select signal. JOG PB: L</td></tr>
<tr><td>3</td><td>HEAD SEL</td><td>O</td><td>Head sekect signal. STILL: H
SLOW: PULSE (TAPE RUN: L, TAPE STOP: H)
Other: L</td></tr>
<tr><td>4</td><td>OSD. OVD</td><td>O</td><td>JOG PB V.SYNC for ON SCREEN DISPLAY
JOG PB: VD
Other: L</td></tr>
<tr><td>5</td><td>RF SWP</td><td>O</td><td>RF SWITCH PULSE</td></tr>
<tr><td>6</td><td>Q. VD</td><td>O</td><td>1. Quasi VD signal. Output at JOG PB
2. VIDEO MUTE signal. Output "H" at no playback of CTL signal.</td></tr>
<tr><td>7</td><td>NA PB</td><td>O</td><td>Normal audio circuit REC/PB select signal. PB: H</td></tr>
<tr><td>8</td><td>IN MUTE</td><td>O</td><td>Video input signal mute signal. MUTE: H</td></tr>
<tr><td>9</td><td>LINE 2 SEL</td><td rowspan="2">O</td><td rowspan="2">Video input select signal.
<table>
<tr><th></th><th>TUNER</th><th>LINE 1</th><th>LINE 2</th></tr>
<tr><td>LINE 2 SEL</td><td>L</td><td>L</td><td>H</td></tr>
<tr><td>LINE 1 SEL</td><td>L</td><td>H</td><td>L</td></tr>
</table></td></tr>
<tr><td>10</td><td>LINE 1 SEL</td></tr>
<tr><td>11</td><td>REC CTL</td><td>O</td><td>Recording CTL signal</td></tr>
<tr><td>12</td><td>EDIT</td><td>O</td><td>Video circuit EDIT ON/OFF signal EDIT; H</td></tr>
<tr><td>13</td><td>——————</td><td></td><td>Not used</td></tr>
<tr><td>14</td><td>$\overline{\text{REC P}}$</td><td>O</td><td>CTL circuit REC/PB select signal. REC: L</td></tr>
<tr><td>15</td><td>CTL INV</td><td>O</td><td>CTL inversion signal. FWD MODE: H</td></tr>
<tr><td>16</td><td>CW/CCW</td><td>O</td><td>Rotating direction control signal for loading motor and CAM motor
During cassette loading/tape threading: H
During cassette unloading/tape unthreading: L</td></tr>
<tr><td>17</td><td>LOAD</td><td>O</td><td>Loading motor rotation control signal. Run: H</td></tr>
</table>

Pin No.	Signal	I/O	Function
18	CAM	O	CAM motor rotation control signal. Run: H
19	MODE 1	I	Mode switch input signal. Mechanism position detection in 4 bits
20	MODE 2		
21	MODE 3		
22	MODE 4		
23	STEP DRIVE	O	PB CTL signal detection mode select signal. Tape run in SLOW/frame by frame playback mode: H Other: L
24	REC $\overline{\text{P}}$ (OD)	O	CTL circuit REC/PB select signal (open drain). REC: HIZ Other: L
25	TA MUTE	I	Tuner audio mute signal. No inut signal: H
26	AMS	O	Head select signal. "H" at SP mode picure search for automatic slection of larger RF output signal. "L" in LP mode; no auto matic selection.
27	STEP 2	O	Not used
28	STEP PULSE	O	Capstan motor step drive signal (open drain) NORMAL PB: 12.5V SLOW PB: 12.5V + L PULSE (1V/p-p)
29	OSD JOG	O	V.SYNC killer signal for character generator (IC601) NORMAL PB: HIZ JOG PB: L
30	————————		Not used
31	GND		
32	$\overline{\text{COSMO RST}}$		Reset signal
33	GND		
34	X'tal		16 MHz X'tal oscillator connecting terminal
35	X'tal		

Pin No.	Signal	I/O	Function
36	$\overline{\text{COSMO CS}}$	I	Chip select signal
37	SI BUS	I	DATA signal Serial communication signal CH-0
38	SO BUS	O	DATA signal
39	$\overline{\text{S CLK}}$	I/O	CLOCK signal
40-43			Not used. Serial communication signal, for INDEX µP CH-1
44	T REEL	I	Rotation pulse from reel base (6 waves output per rotation). Reel base rotation detection, used for indicating remaining amount of tape.
45	S REEL		
46	C-UP/DOWN	I	Cassette compartment up/down detection signal Cassette compartment DOWN: L Other: H
47	CAP. V	I	A/D feedback input signal in constant voltage servo mode (F·FWD/REW, tape threading and unthreading mode)
48	V. DOC	I	Not used
49	VIDEO RF	I	Video RF signal for auto tracking
50			Not used
51	SW POSI	I	RF SW position adjustment
52	GND		
53	UNSW 5V	I	+5V
54	UNSW 5V	I	+5V
55	REC PRF	I	Cassette setting detection and erase prevention tab detection Cassette setting: ʃ Without tab: L
56	T. TENS	I	Tape end detection signal Tape end: H (pulse) REC/PB: L
57	S. SENS	I	
58	C. SYNC	I	Composite sync signal. Separated from video signal
59	PB CTL	I	For capstan phase servo and mute

Pin No.	Signal	I/O	Function
60	DRM PG	I	Drum PG signal
61	DRM FG	I	Drum FG signal (300 Hz)
62	CAP FG	I	Capstan FG signal. SP mode: Approx. 1515 Hz
63	$\overline{\text{CS INDEX}}$	O	Not used
64	CAP RVS	O	Capstan motor rotating direction control signal FWD direction: L RVS direction: H
65	CAP D/A	O	Capstan servo error signal, H/M/L 3-pulse output
66	DRUM D/A	O	Drum servo error signal, H/M/L 3-pulse output
67	CAP STOP	O	Capstan servo ON/OFF control signal. Servo ON: L
68	LAMP	O	Tape end detection LED lamp signal
69	VD CTL	I	Linear time counter and system control signal
70	DEW	I	Dew detection signal. Dew: H, Normal: L
71	NM 1	I	Not used (pull up to +5V)
72	VDD	I	+5V
73	GND		
74	VDD	I	+5V
75	$\overline{\text{TV}}$/VTR	O	Not used
76	A MUTE	O	Normal audio mute signal. MUTE: H
77	$\overline{\text{SP}}$	O	Video/audio frequency characteristic select signal SP: L, LP: H
78	LP	O	Chroma/audio circuit select signal. SP: L, LP: H
79	REC.$\overline{\text{P}}$	O	REC/PB select signal for video/REC/PB amplifier, audio CTL circuits. REC: H
80	REC	O	PB Y RF mute signal. REC: H

[IC001: CXP50116-M2]

Pin No.	Signal	I/O	Function
1–17	S0-S16	O	Fluorescent display tube segment drive
18	S17	O	Buzzer clock (not used)
19–28	T9–T10	O	Fluorescent display tube grid drive
30	TX	I	32.768 kHz X'tal backup clock (used for clock)
31	T EX	O	
32	RESET	I	Reset input. Reset: L
33, 34	VDD		+5V
35–42	AD0–AD7	I	Function key (inclusive of shuttle search dial) input
43	$\overline{EC}$	I	Event count input (not used)
44	SCLK	O	Serial communication bus for System control μP
45	SO	O	
46	SI	I	
47	H DET	I	H DET (sync signal detection) signal for blue back screen With video signal: L
48	DIST 0	I	System selection (not used)
49	DIST 1		
50	DIST 2		
51	TA MUTE	O	Audio mute signal H DET signal "H": H
52	V_L (DATA)	O	VHF low band select signal. (data signal when FS tuner is used)
53	V_H (LATCH)	O	VHF high band select signal. (LATCH signal when FS tuner is used
54	U (PLL CLK)	O	UHF band select signal. (PLL CLK signal when FS tuner is used)
55	AFT DWN	I	Tuner tuning condition detection signal.
56	AFT UP		
57	MEM BUSY	I	Non-voltile memory busy signal.
58	MEM DATA	I/O	Non-volatile memory data signal.

Pin No.	Signal	I/O	Function
59	BUZZER ON	O	Buzzer ON/OFF control signal ON: L
60	VC PWM	O	Tuner VC voltage control signal (PWM demodulated wave)
61	POWER FAIL	I	Power failure detection signal. UNSWD 5V voltage low: L
62	SIRCS IN	I	Infrared remote control signal and control S signal input
63	$\overline{\text{COSMO RST}}$	O	Reset signal output Reset: L
64	POWER ON	O	Power ON/OFF control signal Power ON: H
65	MEM CS	O	Non-volatile memory chip select signal
66	MEM CLK	O	Non-volatile memoryu clock signal
67	VPS CLK	O	Not used
68	VPS CS		
69	COSMO CS	O	System control µP chip select signal
70	CG CS	O	Character generator chip select signal
71	GND		
72	X TAL	O	4.19 MHz system clock
74	EX TAL	I	
73	VDD		+5V
75	V REF	I	+5V (reset circuit reference voltage)
76	V FDP	I	-30V (fluorescent display tube drive voltage)
77			Not used
78	SYSTEM1	O	System control signal, TV system selection
79	SYSTEM 2		
80	SYSTME 3		

2-2. MECHANISM OPERATION

2-2-1. Cassette Loading/unloading

Cassette is loaded and unloaded by the loading motor.

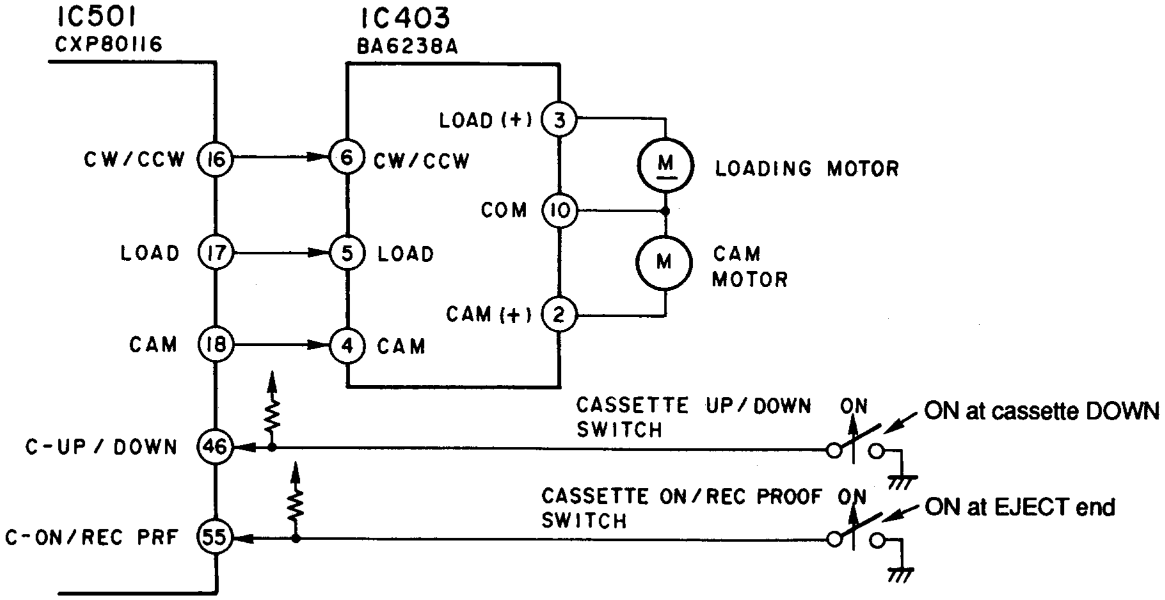

IC501
CXP80116
IC403
BA6238A
LOAD (+) 3
CW/CCW 16
6 CW/CCW
M
LOADING MOTOR
COM 10
LOAD 17
5 LOAD
M
CAM MOTOR
CAM (+) 2
CAM 18
4 CAM
CASSETTE UP/DOWN SWITCH
ON
ON at cassette DOWN
C-UP / DOWN 46
CASSETTE ON/REC PROOF SWITCH
ON
ON at EJECT end
C-ON/REC PRF 55

Fig. 2-3

MODE	IC501			IC403		
	CW/$\overline{CCW}$	LOAD	CAM	COM	LOAD (+)	CAM (+)
CASSETTE LOADING	H	H	L	0 V	12 V	0 V*
CASSETTE UNLOADING	L	H	L	12 V	0 V	12 V*
STOP	H/L	L	L	0 V	0 V	0 V

*: CAM motor is not running on the same voltage of COM terminal.

[Cassette loading]

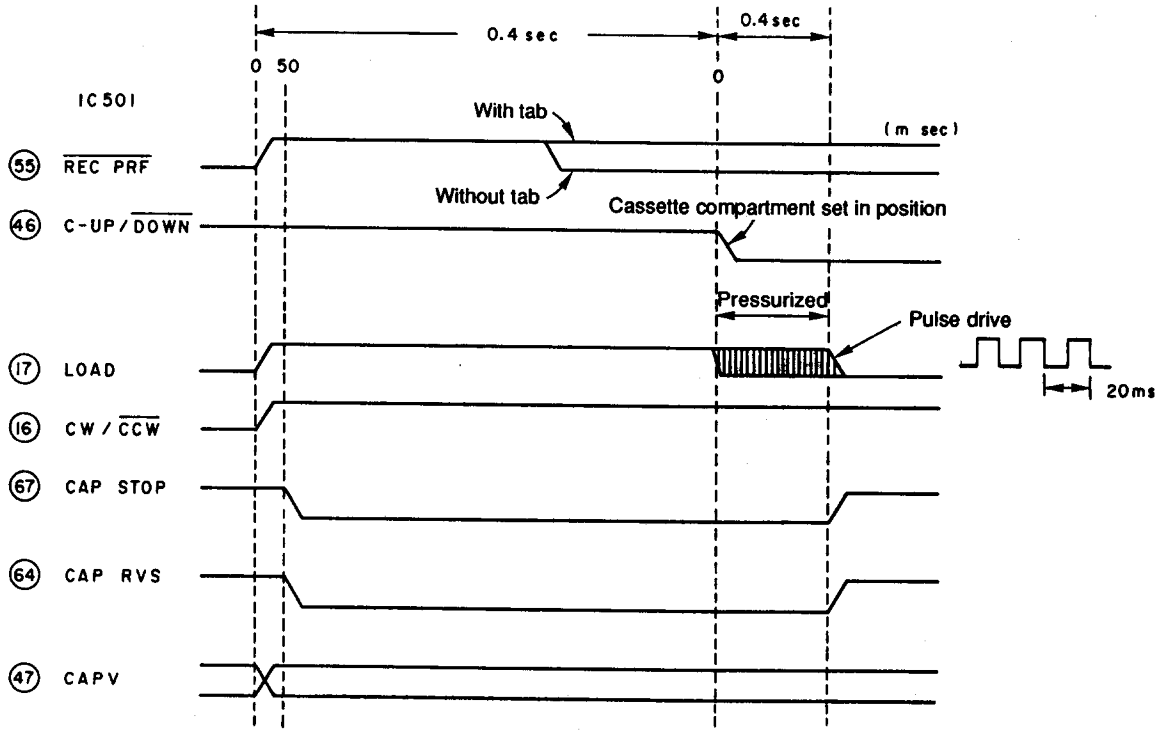

0.4 sec
0.4sec
0 50
0
IC501
With tab
(m sec)
(55) REC PRF
Without tab
Cassette compartment set in position
(46) C-UP/DOWN
Pressurized
Pulse drive
(17) LOAD
20ms
(16) CW/CCW
(67) CAP STOP
(64) CAP RVS
(47) CAPV

Fig. 2-4

1) When cassette is loaded, the CASSETTE ON switch turns ON and REC PROOF signal becomes "H".

Note: CASSETTE ON switch is also used to detect cassette erase prevention tab. When cassette loading is detected, it functions as REC PROOF switch.

2) When System control µP IC501 DETECTS "H" while the loading motor starts running to pull in the casette.

   And, at the same time, the CAP STOP signal becomes "L" and the CAP RVS signal becomes "H". The capstan motor starts running and when the cassette is set down, the tape slack is removed.

3) When the cassette is set down, the CASSETTE UP/DOWN detecting switch turns C-UP/$\overline{\text{DOWN}}$ signal to "L".

   If, at this time, the cassette safety tab is broken off, the REC PROOF switch turns off the REC PROOF signal is reset to "L".

Note: The cassette with broken tab is automatically set in playback mode at the completion of tape threading.

4) When the system control µP IC501 detects the fall (⌊) of C-UP/DOWN signal, the loading motor is pulse driven and, when the cassette is held in position firmly, the LOAD signal becomes "L" and the loading motor stops running.

   At this time, the capstan motor also stops running when the CAP STOP signal becomes "H" and then CAP RVS signal is reset to "L".

The above operation completes the cassette loading, and tape threading is started thereafter.

[Cassette unloading]

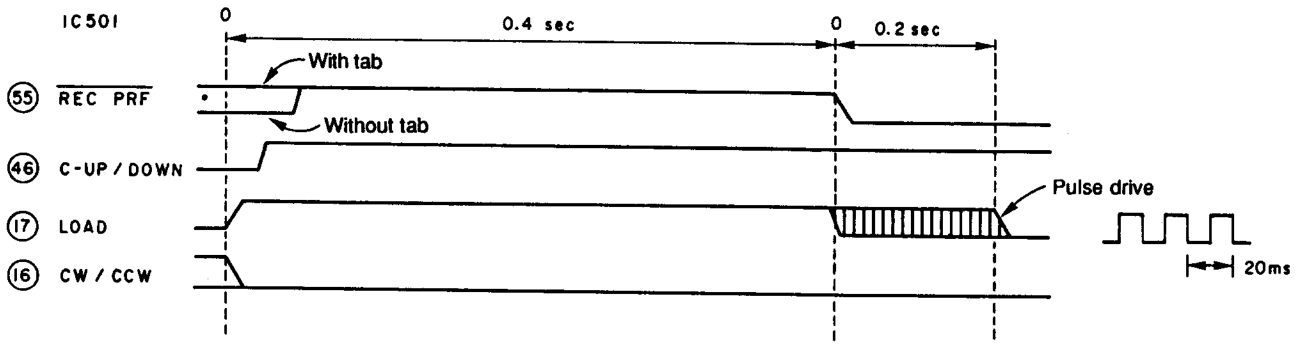

IC501
0
0.4 sec
0
0.2 sec
With tab
Without tab
(55) REC PRF
(46) C-UP / DOWN
⑰ LOAD
⑯ CW / CCW
Pulse drive
20ms

Fig. 2-5

1) The system control microprocessor IC501 turns the LOAD signal to "L" and CW/$\overline{\text{CCW}}$ signal to "L" to rotate the loading motor in unloading direction to move up the cassette compartment.
2) When the cassette compartment moves up, the C UP/$\overline{\text{DOWN}}$ signal becomes "H" and $\overline{\text{REC PRF}}$ signal turns to "H".

Note: $\overline{\text{REC PRF}}$ signal

(1) Without SAFETY TAB ····· From "L" to "H"

(2) With SAFETY TAB ·········· Remains in "H"

3) When cassette unloading is completed, the REC PROOF switch turns ON and the $\overline{\text{REC PRF}}$ signal becomes "L".
4) When the system control microprocessor detects the fall (⌉⌊) of the $\overline{\text{REC PRF}}$ signal, the LOAD signal becomes "L" and the loading motor stops running after 0.2 second of pulse drive.

The above completes the cassette unloading.

2-2-2. Tape Threading/Unthreading

Tape threading and unthreading are performed by the CAM motor.

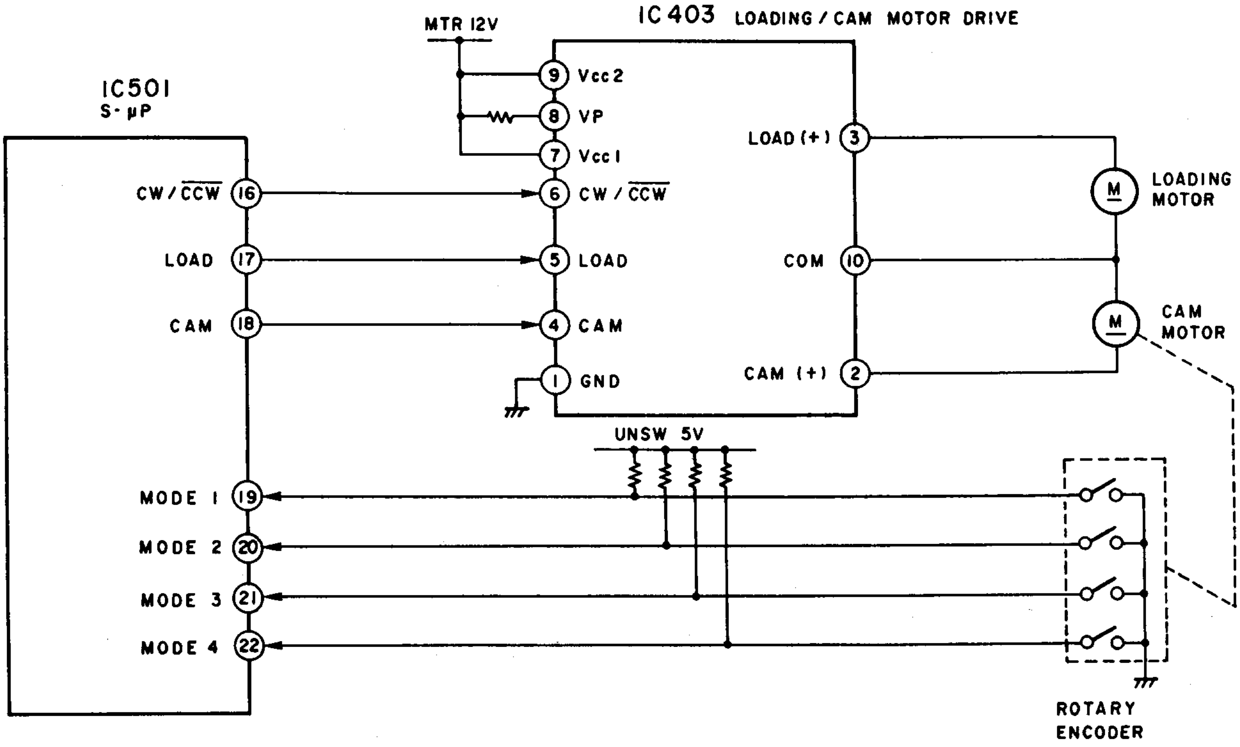

MTR 12V
IC403 LOADING / CAM MOTOR DRIVE
IC501
S-μP
CW/CCW 16
LOAD 17
CAM 18
9 Vcc2
8 VP
7 Vcc1
6 CW/CCW
5 LOAD
4 CAM
1 GND
LOAD (+) 3
COM 10
CAM (+) 2
M
LOADING MOTOR
M
CAM MOTOR
UNSW 5V
MODE 1 19
MODE 2 20
MODE 3 21
MODE 4 22
ROTARY ENCODER

Fig. 2-6

MODE	IC501			IC403		
	CW/$\overline{\text{CCW}}$	LOAD	CAM	COM	LOAD M	CAM M
THREADING	H	L	H	0 V	0 V	12 V
UNTHREADING	L	L	H	12 V	12 V*	0 V
STOP	H/L	L	L	0 V	0 V	0 V

*: The loading motor is not running on the same voltage of the COM terminal.

CAM motor running direction	Mechanism position	MODE1	MODE2	MODE3	MODE4	Application
	STOP 1	L	L	H	H	Power OFF position, stop position (temporary) from high speed direction REW
	FR1	H	L	H	H	High speed REW
Threading direction ↓ Untheading direction ↑	EJECT	L	H	H	H	Cassette loading/unloading
	LOADING	H	H	L	H	Tape threading/unthreading
	L. END	L	H	L	H	Tape threading end
	FR2	H	L	L	H	FF and REW
	STOP 2	L	L	L	H	Brake position from FF/REW
	STOP 3	L	L	L	L	Normal STOP position
	STOP 4	L	L	H	L	Tape slack position
	FWD/CUE	H	L	H	L	REC, PB, X2 and CUE
	FWD/STEP	L	H	H	L	+SLOW, +STILL and REC PAUSE. Braking force is given lightly to capstan
	RVS/STEP	H	H	L	L	-SLOW and -STILL. Braking force is given lightly to capstan.
	RVS/REV	H	L	L	L	-X1, -X2 and REVIEW
	Changeover	H	H	H	H	Mechanical position changeover

[Detection of mechanism position]

The tape is pulled out (threading) by the CAM motor to perform various modes. Tape position varies with each mode. To detect the tape position, Mode 1-4 signals are used. These signals are output from the rotary encoder.

The system control microprocessor detects the mechanism position using the MODE signals.

[Tape threading]

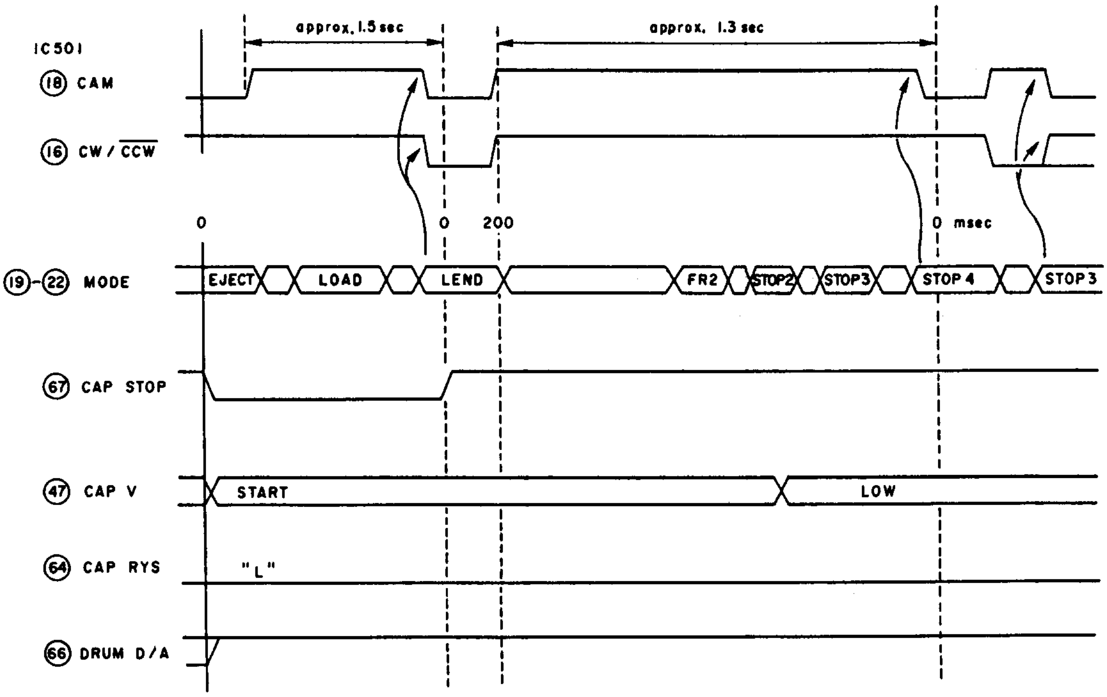

approx. 1.5 sec
approx. 1.3 sec
IC501
⑱ CAM
⑯ CW/$\overline{\text{CCW}}$
0
0
200
0 msec
⑲-㉒ MODE
EJECT
LOAD
LEND
FR2
STOP2
STOP3
STOP 4
STOP3
(67) CAP STOP
㊼ CAP V
START
LOW
(64) CAP RYS
"L"
(66) DRUM D/A

Fig. 2-7

1) The capstan motor rotates in normal direction when the CAP STOP signal and the CAP RVS signal are "L". Then the supply reel is rotated by the pendulum arm.

   At the same time, the drum motor starts running when the DRUM D/A signal is "H". In the steady state (1500 rpm) of the drum motor, the drum servo will operate to output the DRUM D/A signal in 3 values (H,M,L) of pulses.
2) Next, the CAM motor rotates in the tape threading direction when the CAM signal is "H"(CW/$\overline{\text{CCW}}$ signal "H"), thereby starting the tape threading.
3) While the CAM motor is running, the mechanism position is changed as follows.

   EJECT → LOAD → LOAD END

   When the system control microprocessor IC501 detects the LOAD END position by the Mode 1-4 signals, the CAM signal becomes "L" to stop the CAM motor.

   At the same time, the capstan motor stops running when the CAP STOP signal is "H".

   In this way, the tape threading is completed. Then, the mechanism position is changed to STOP3.
4) The system control microprocessor IC501 sets the CAM signal and CW/$\overline{\text{CCW}}$ signal to "H" again to rotate the CAM motor, thus changing the mechanism position as follows.

   LOAD END→FR2→STOP2→STOP3→STOP4

   When the system control microprocessor IC501 detects STOP4, the CW/$\overline{\text{CCW}}$ signal becomes "L" and the CAM motor rotates in reverse to change the mechanisms position from STOP4 to STOP3, thereby slacking the tape.
5) When STOP3 is detected, the CAM signal becomes "L" to stop the CAM motor.

The above operation completes the tape threading.

[Tape unthreading]

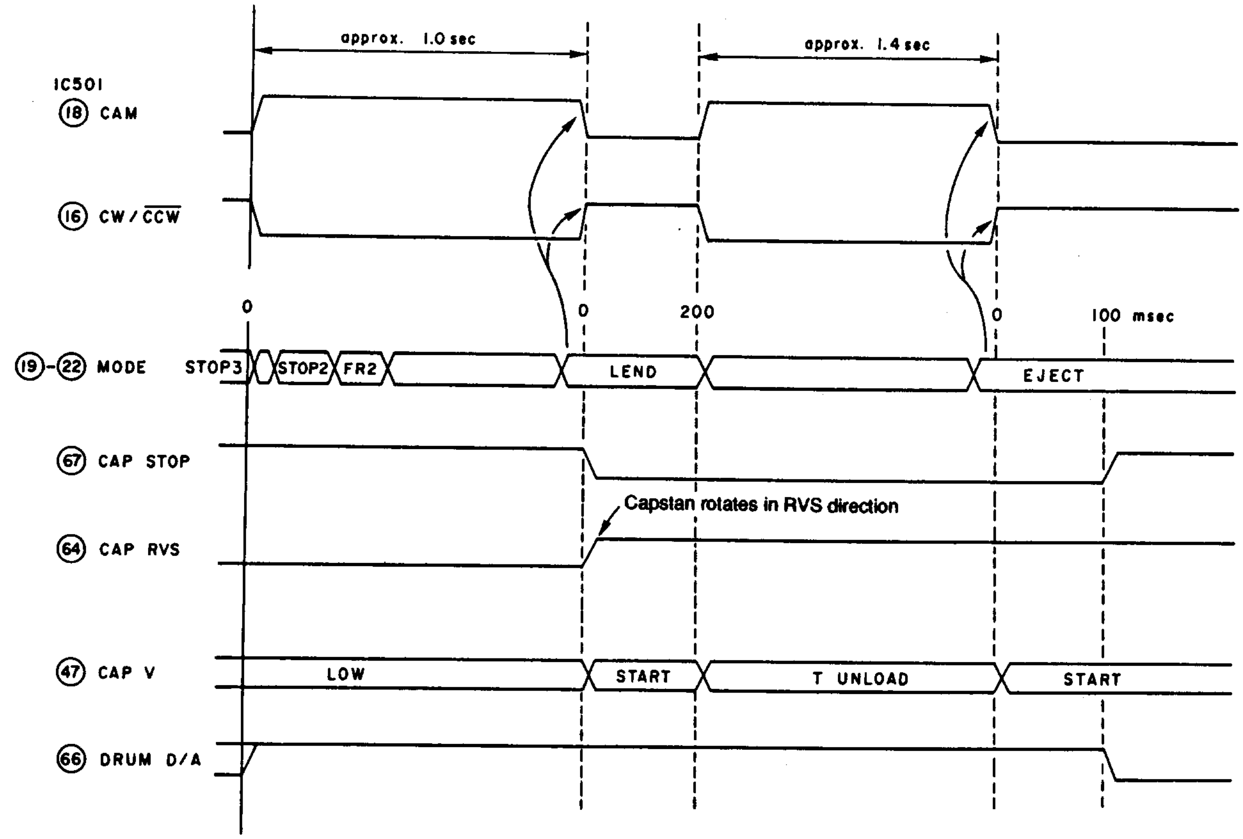

approx. 1.0 sec
approx. 1.4 sec
IC501
⑱ CAM
⑯ CW/$\overline{CCW}$
0
0
200
0
100 msec
⑲-㉒ MODE
STOP3
STOP2
FR2
LEND
EJECT
(67) CAP STOP
Capstan rotates in RVS direction
(64) CAP RVS
㊼ CAP V
LOW
START
T UNLOAD
START
(66) DRUM D/A

Fig. 2-8

1) By pressing the EJECT button, the timer/tuner microprocessor IC001 instructs tape unthreading and cassette unloading to the system control microprocessor IC501 through the serial communication bus.
2) The system control microprocessor IC501 sets the CAM signal to "H" and the CW/$\overline{\text{CCW}}$ signal to "L" to rotate the CAM motor in the unthreading direction, thereby changing the mechanism position of follows.
   STOP→ STOP2→ FR2→ LOAD END
   When the drum motor is not running, the CAM motor is rotated and, the same time, the DRUM D/A signal is set to "H" to rotate the drum motor.
3) When the system control microprocessor IC501 detects the mechanism position LOAD END by the Mode 1-4 signals, the CAM signal becomes "L" to stop the CAM motor.
   Next, the capstan motor runs in reverse direction when the CAP STOP signal is "L" and the CAP RVS signal is "H", thus rotating the supply reel base to rewind the tape.
4) the CAM motor rotates in the unthreading direction when the CAM signal is "H" and the CW/$\overline{\text{CCW}}$ signal is "L". In this way, the mechanism position is changed as follows.
   LOAD END→ LOAD→ EJECT
   Thus, the tape is wound into the cassette.
5) When the mechanism position EJECT is detectedə, the CAM signal becomes "L" and the CAP STOP signal becomes "H" to stop the capstan motor.

Next, the cassette unloading is started.

2-2-3. STOP → Playback mode

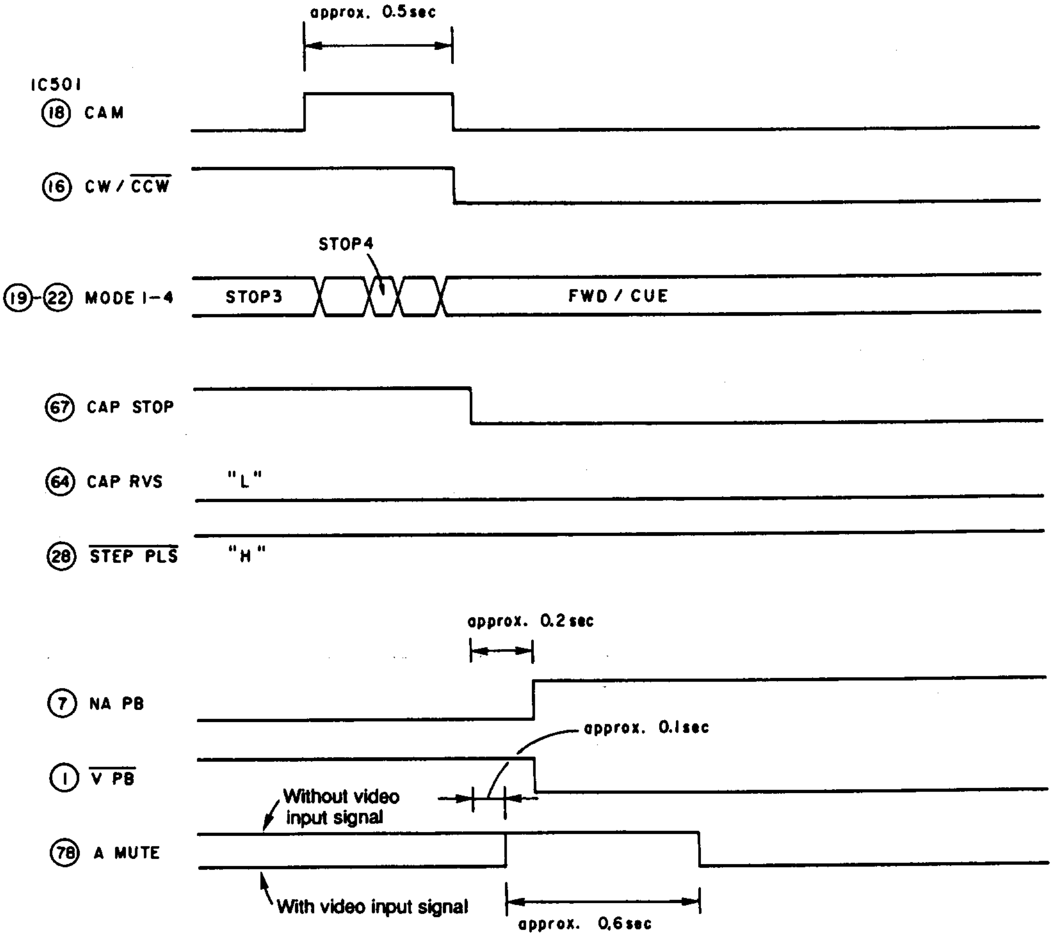

approx. 0.5sec
IC501
⑱ CAM
⑯ CW / $\overline{CCW}$
STOP4
⑲-㉒ MODE 1-4
STOP3
FWD / CUE
(67) CAP STOP
(64) CAP RVS
"L"
㉘ $\overline{STEP\ PLS}$
"H"
approx. 0.2sec
⑦ NA PB
approx. 0.1sec
① $\overline{V\ PB}$
Without video input signal
(78) A MUTE
With video input signal
approx. 0.6sec

Fig. 2-9

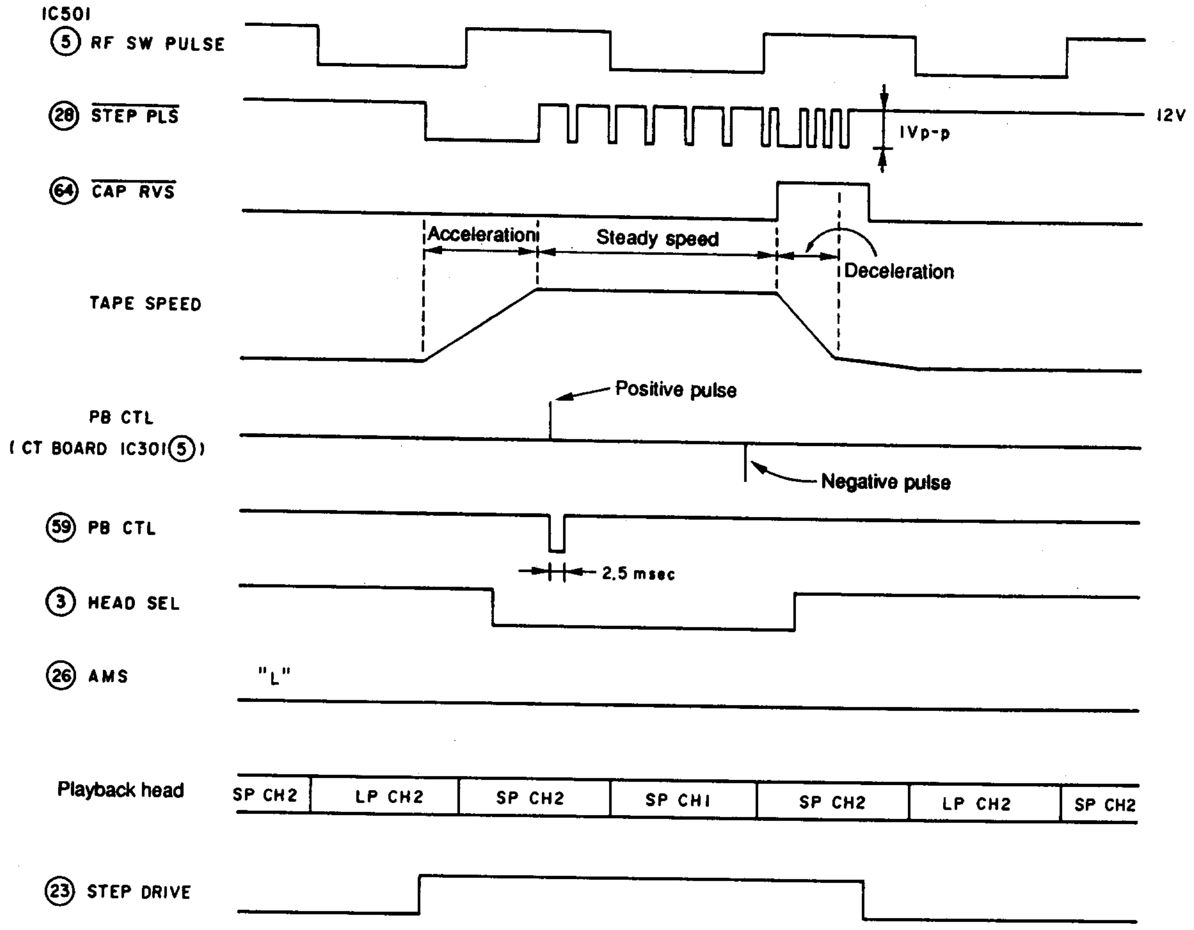
1) When the CAM signal is "H" and the CW/$\overline{CCW}$ signal is "H", the CAM motor rotates in the threading direction and the mechanism position is changed as follows.
   STOP3 → STOP4 → FWD/CUE
2) When the system control microprocessor detects the mechanism position FWD/CUE, The CAM signal becomes "L" to stop the CAM motor.
3) When the CAP STOP signal is "LL", the capstan motor rotates in the normal direction to run the tape forward.
4) Audio output is muted when A MUTE signal is "H".
5) The following 2 operations are performed at the same time about 0.2 second after the capstan motor starts rotating.

(1) NA PB signal becomes "H" to set the normal audio circuit in normal playback mode.

(2) The $\overline{V\ PB}$ signal becomes "L" and the normal playback signal becomes "H" to set the video circuit in normal playback mode.

2-2-4. Normal Frame by Frame Playback (SP mode)

Note: In the +1/5 SLOW mode, frame by frame playback is performed once every 200 msec (10 fields).



IC501
⑤ RF SW PULSE
㉘ STEP PLS
1Vp-p
12V
64 CAP RVS
Acceleration
Steady speed
Deceleration
TAPE SPEED
Positive pulse
PB CTL
(CT BOARD IC301⑤)
Negative pulse
59 PB CTL
2.5 msec
③ HEAD SEL
㉖ AMS
"L"
Playback head
SP CH2
LP CH2
SP CH2
SP CH1
SP CH2
LP CH2
SP CH2
㉓ STEP DRIVE

Fig. 2-10

1) The system control microprocessor IC501 sets the $\overline{\text{STEP PLS}}$ signal to "L" after a given time (approx. 15 msec) from the fall (⌝) of RF SW pulse so that the capstan speed is accelerated.
   When the RF SW pulse is "L", the LP CH2 head is used and, at the same time, the step drive signal is set to "H". In this way, the positive pulse of PB CTL signal can be detected. For details, refer to the servo circuit "4-2-6 Playback of PB on signal during slow/frame by frame playback".
2) When the RF SW pulse is "H", the SP CH2 head is used.
3) About 4 msec after the rise (∫) of the RF SW pulse signal, the HEAD SEL signal is changed from "H" to "L", thus changing the head from STILL mode to SLOW mode.
   For the STILL mode and SLOW mode, the head to be used is different as shown below.

RF SW PULSE / MODE	L	H
STILL	LP CH2	SP CH2
SLOW	SP CH1	SP CH2

4) The system control microprocessor IC501 monitors the capstan speed (tape speed) by the cycle of the CAP FG signal. When the tape speed becomes equal to the normal playback speed, the capstan speed stops accelerating and is set in the steady speed operation.
5) When the tape is running, the positive pulse of the PB CTL signal, a comparison signal for normal playback capstan phase servo, is played back.
6) Next, when the RF SW pulse becomes "L", the SP CH1 head is selected since the HEAD SEL signal is "L".
   This is the same as the normal playback so it is different from the STILL playback (by LP CH2 head).
7) When the RF SW pulse signal becomes "H", the SP CH2 head id selected.
8) The system control microprocessor IC501 counts the pulses from the start of frame by frame playback of CAP FG signal and the pulses from the start of the positive pulse of PB CTL signal. When the pulses read a given value, the CAP RVS signal becomes "H" and the $\overline{\text{STEP PLS}}$ signal becomes "L" to apply a braking force to the capstan.
9) The HEAD SEL signal becomes "H" about 4 msec after the rise (ʃ) of the RF SW pulse signal, thus changing the head to the STILL mode.
10) When the capstan speed (tape speed) becomes slow with the braking force, the cycle of CAP FG signal becomes longer, changing to the pulse brake operation.
11) When the RF SW pulse is set to "L", the LP CH2 head is selected since the HEAD SEL signal is "H".
12) The CAP RVS signal is reset to "L".
13) The capstan stops running and turns to the STILL mode.

2-2-5. Reverse Frame by Frame Playback (SP Mode)

Note: In the -1/5 SLOW mode, this frame by frame playback is performed once every 200 msec (10 fields)

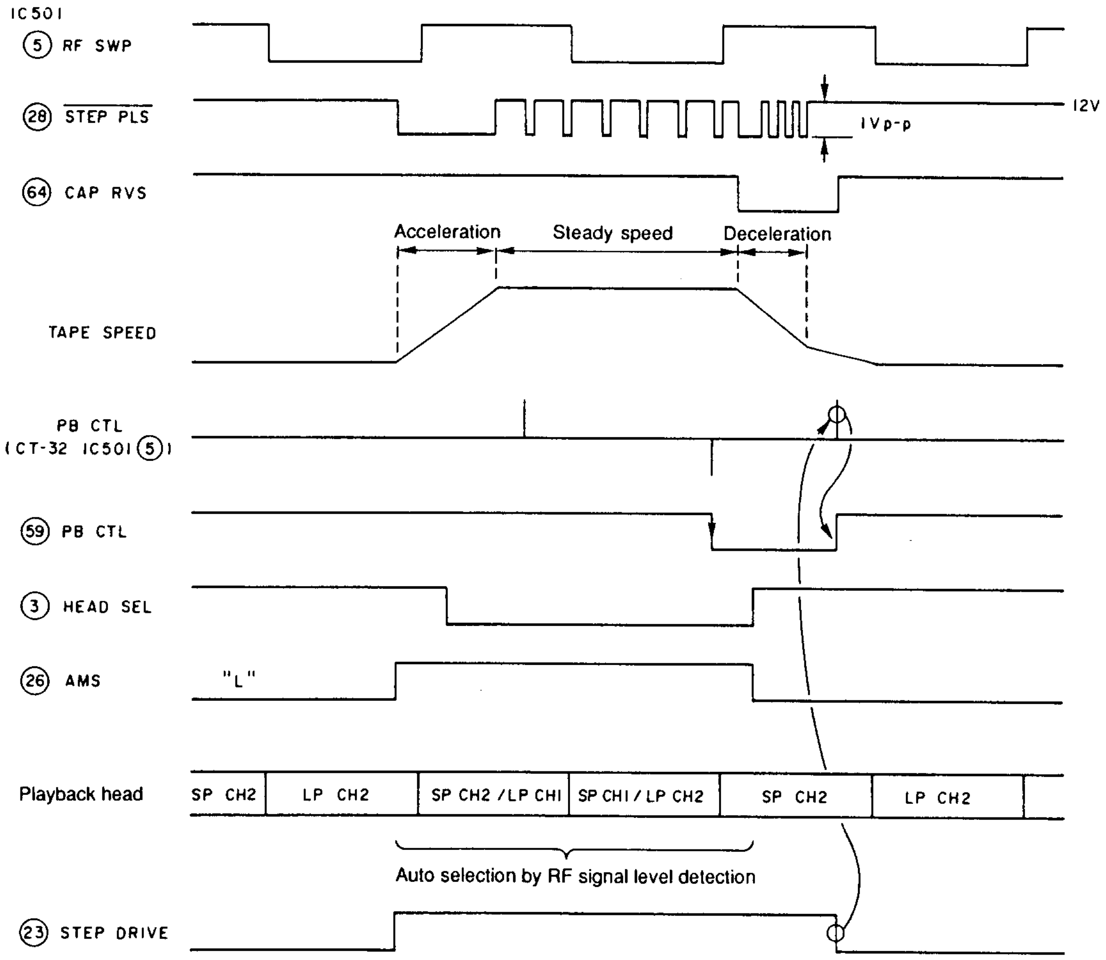

IC501
⑤ RF SWP
㉘ STEP PLS
12V
1Vp-p
㊹ CAP RVS
Acceleration
Steady speed
Deceleration
TAPE SPEED
PB CTL
(CT-32 IC501⑤)
(59) PB CTL
③ HEAD SEL
㉖ AMS
"L"
Playback head
SP CH2
LP CH2
SP CH2 /LP CH1
SP CH1 / LP CH2
SP CH2
LP CH2
Auto selection by RF signal level detection
㉓ STEP DRIVE

Fig. 2-11

- The capstan is controlled in the same way as the normal frame by frame playback, except that the tape direction is reversed so the CAP RVS signal is inverted.
- When the AMS signal becomes "H", the head having a larger output is automatically selected. (Although the HEAD SEL signal is "L" as in the case of the normal mode, the AMS signal takes precedence over the other).

Note: For details of AMS signal, refer too"3-8 Head amplifier system",

- For details of STEP DRIVE signal, refer to "4-2-6 Playback of PB CTL signal in slow/frame by frame playback mode" for the servo circuit.

2-2-6. STOP → REC Mode

Note: Tape is rewound for editing before recording signals.

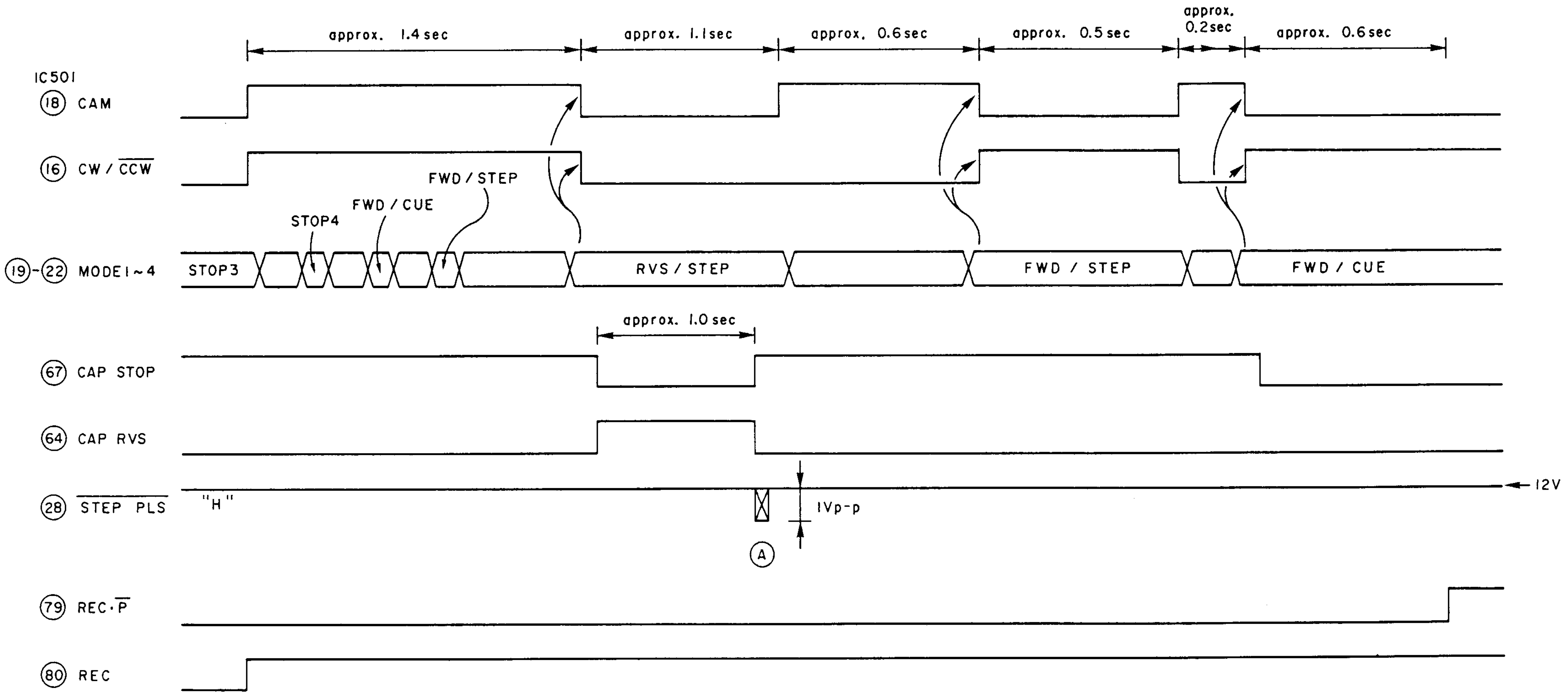

approx. 1.4 sec
approx. 1.1 sec
approx. 0.6 sec
approx. 0.5 sec
approx. 0.2 sec
approx. 0.6 sec
IC501
⑱ CAM
⑯ CW / CCW
⑲-㉒ MODE 1~4
STOP3
STOP4
FWD / CUE
FWD / STEP
RVS / STEP
FWD / STEP
FWD / CUE
approx. 1.0 sec
(67) CAP STOP
(64) CAP RVS
㉘ STEP PLS
"H"
12V
1Vp-p
Ⓐ
(79) REC·P
(80) REC

Fig. 2-12

1) Turn ON the RP board Q814 at REC signal "H". The PB RF signal is muted.

   At this time, set the CAM signal and CW/$\overline{\text{CCW}}$ signal to "H", then the CAM motor rotates in the threading direction. In this way, the mechanism position is changed as follows.

   STOP3 → STOP4 → FWD/CUE → FWD/STEP → RVS/STEP

2) When the system control microprocessor IC501 detects the mechanism position REV/STEP, the CAM motor stops at CAM signal "L".

3) Set the CAP RVS signal to "H" and the CAP STOP signal to "L" to rotate the capstan in reverse direction. Then, the tape runs in the RVS direction. When the tape runs in reverse direction for about 1 second, new signals are recorded on the pre-recorded portions. This is called EDIT operation. In this case, the system control microprocessor counts the CTL pulses corresponding to me amount of the rewound tape.

4) After the target CTL pulses are detected, set the CAP STOP signal to "H" to stop the capstan. At this time, the capstan is pulse driven in normal direction by the $\overline{\text{STEP PULSE}}$ signal and CAP RVS signal and then stops quickly ("A" in Fig. 2-12).

5) Next, set the CAM signal to "H" and CW/$\overline{\text{CCW}}$ signal to "L" to rotate the CAM motor in the unthreading direction. In this way, the mechanism position is changed as follows.

   RVS/STEP→ FWD/STEP→ FWD/CUE

6) When the system control microprocessor detects the mechanism position FWD/CUE, set the CAM signal to "L" to stop the CAM motor.

7) While the CAP RVS signal is being set to "L", rotate the capstan motor in normal direction by setting the CAM STOP signal to "L".

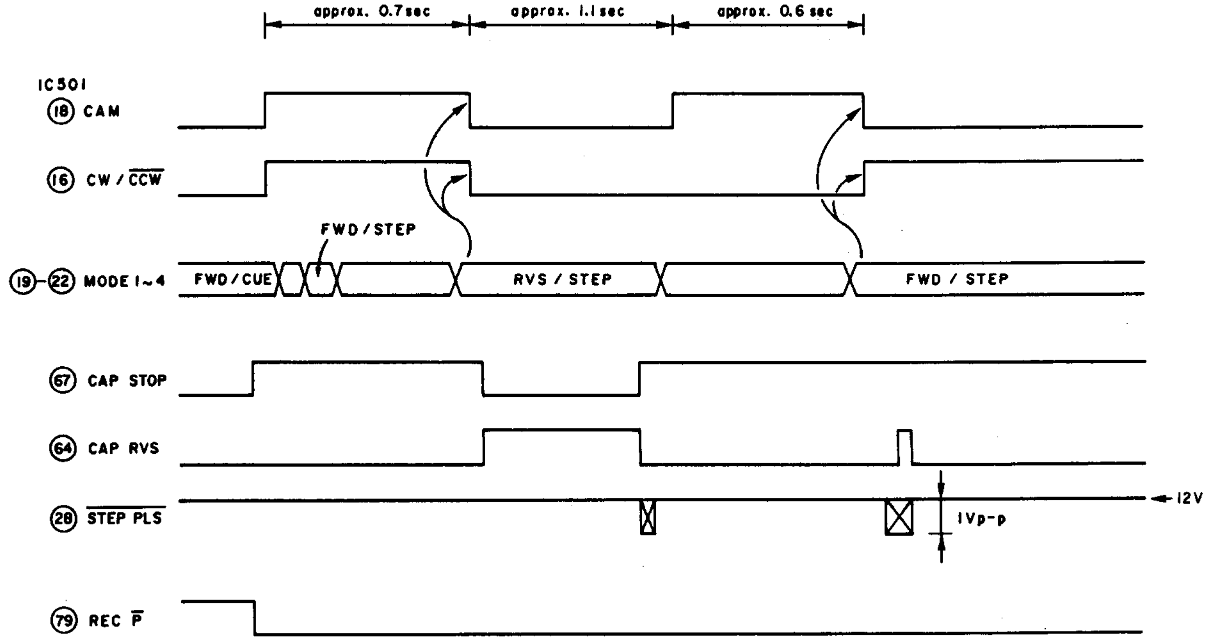
   (In this case, the capstan servo performs the same operation as in the playback mode, so the phase servo is effected by using the CTL signal.)

8) The system control microprocessor monitors the amount of the rewound tape. When the tape reaches just before the point of rewinding the tape, the system control microprocessor beings to record the signals.

- Set the REC $\overline{\text{P}}$ signal to "H" to operate the full field head, then video and audio signals are recorded in tape.

2-2-7. REC → REC PAUSE Mode

Note: Tape is rewound for editing.



approx. 0.7sec
approx. 1.1sec
approx. 0.6 sec
IC501
⑱ CAM
⑯ CW/$\overline{\text{CCW}}$
FWD/STEP
⑲-㉒ MODE 1~4
FWD/CUE
RVS / STEP
FWD / STEP
(67) CAP STOP
(64) CAP RVS
㉘ $\overline{\text{STEP PLS}}$
12V
1Vp-p
(79) REC $\overline{\text{P}}$

Fig. 2-13

1) When the REC $\overline{\text{P}}$ signal is "L", video and audio signals recording will stop. At this time, set the CAP STOP signal is "H" to stop the capstan motor.
2) Set the CAM signal and CW/$\overline{\text{CCW}}$ signal to "H" to rotate the CAM motor in the threading direction. In this way, the mechanism position is changed as follows.
   FWD/CUE→ FWD/STEP→ RVS/STEP
3) When the system control microprocessor IC502 detects the mechanism position RVS/STEP, the CAM signal becomes "L" to stop the CAM motor.
4) Set the CAP STOP signal to "L" and the CAP RVS signal to "H" to rotate the capstan motor in reverse direction. Then the tape will run in reverse direction. At this time, the system control microprocessor counts the amount of tape being rewound.
5) After the target CTL pulses are counted, the system control microprocessor sets the CAP STOP signal "H" when the capstan motor is braked by the $\overline{\text{STEP PULSE}}$ signal, and stops immediately.
6) Set the CAM signal to "H" and CW/$\overline{\text{CCW}}$ signal to "L" to rotate the CAM motor in the unthreading direction. In this way, the mechanism position is changed as follows.
   RVS/STEP→ FWD/STEP
7) When the system control microprocessor IC501 detects the mechanism FWD/STEP, the CAM signal becomes "L" to stop the CAM motor.
8) The capstan motor is pulse driven by the $\overline{\text{STEP PULSE}}$ signal and runs in normal direction.

2-2-8. REC PAUSE → REC Mode (REC PAUSE release)

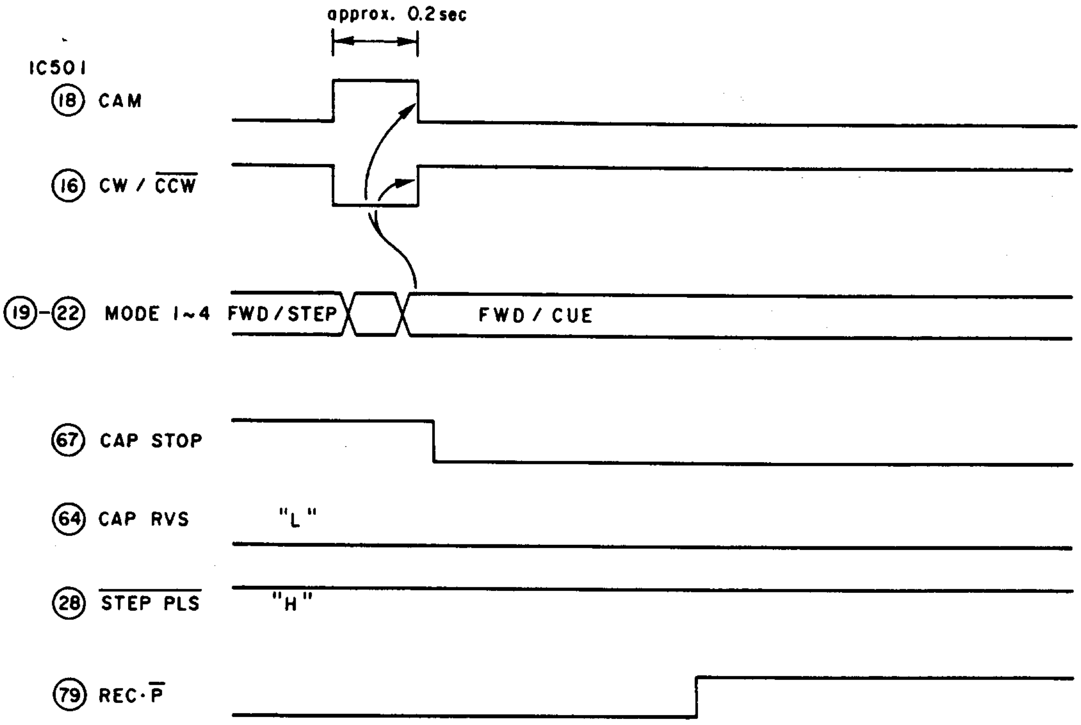

approx. 0.2sec
IC501
⑱ CAM
⑯ CW / $\overline{CCW}$
⑲-㉒ MODE 1~4
FWD/STEP
FWD / CUE
(67) CAP STOP
(64) CAP RVS
"L"
(28) $\overline{STEP\ PLS}$
"H"
(79) REC·$\overline{P}$

Fig. 2-14

1) Set the CAM signal to "H" and CW/$\overline{CCW}$ signal to "L" to rotate the CAM motor in the unthreading direction. In this way, the mechanism position is changed as follows.
   FWD/STEP→ FWD/CUE
2) When the system control microprocessor IC501 detects the mechanism position FWD/CUE, the CAM signal becomes "L" to stop the CAM motor.
3) While the CAP RVS signal is set to "L", rotate the capstan in normal direction by setting the CAP STOP signal to "L". The tape will run in normal direction.
   (In this case, the capstan servo is in the playback mode.)
   The system control microprocessor monitors the amount of tape being wound by counting the CTL pulses.
4) The tape runs so that the PB CTL signal is synchronized with the input video signal by the capstan phase servo.
5) When the tape reaches just before the end of pre-recorded portion while counting the CTL pulses, the REC $\overline{P}$ signal becomes "H" to operate the full erase head, then the video and audio signal are recorded in tape.

2-2-9. REC → STOP Mode

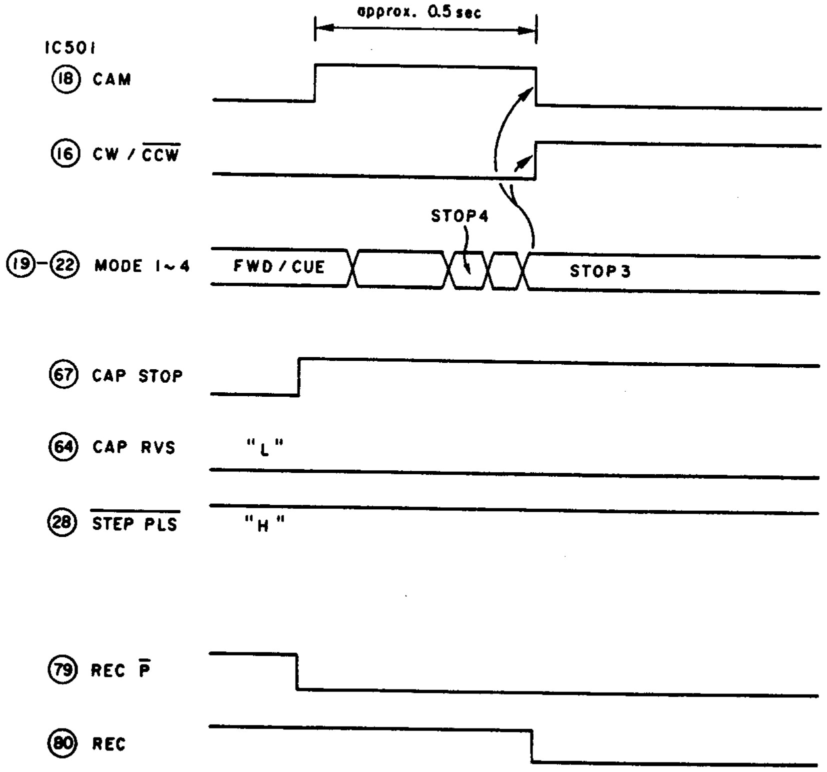

approx. 0.5 sec
IC501
⑱ CAM
⑯ CW / CCW
STOP4
⑲-㉒ MODE 1~4
FWD / CUE
STOP 3
(67) CAP STOP
(64) CAP RVS
"L"
㉘ STEP PLS
"H"
(79) REC P̄
(80) REC

Fig. 2-15

1) Set the REC P̄ signal to "L" to stop recording of video and audio signals and stop the full erase head.

   At the same time, the CAP STOP signal becomes "H" to stop the capstan motor.

   Set the CAM signal to "H" and CW/$\overline{\text{CCW}}$ signal to "L" to rotate the CAM motor in the unthreading direction. In this way, the mechanism position is changed as follows.

   FWD/CUE→ STOP4→ STOP3

2) When the system control microprocessor detects the mechanism position STOP3, the CAM signal becomes "L" to stop the CAM motor. When the REC signal is "H", the RP board Q814 turns OFF to release muting of Playback RF signal.

2-3. PROTECTIVE CIRCUIT

Using the following detecting circuits, the system control microprocessor prevents damage to the mechanism and tape at occurrence of trouble.

- Safety tab switch
- Tape TOP/END detector
- Reel base rotation detector
- Dew detector
- Drum rotation detector

2-3-1. Safety Tab Switch

The safety tab switch is used to detect the presence or absence of cassette safety tab when cassette has been loaded.

SAFTY TAB	S002	IC501 pin (55)	Operation
With tab	OFF	H	Recording possible
Without tab	ON	L	Recording impossible

The safety tab switch also serves to detect cassette loading.

Note: For details of the safety tab switch, refer to "2-1-1 Cassette loading/unloading".

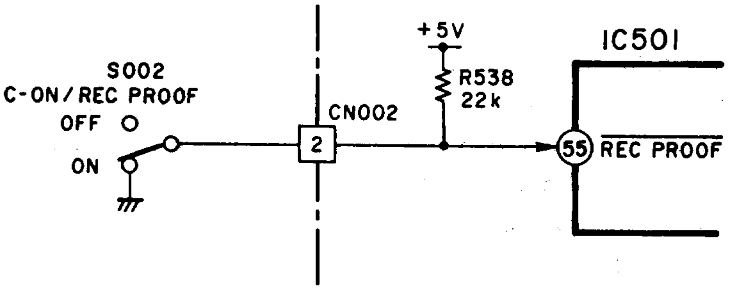


Fig. 2-16

2-3-2. Tape TOP/END Sensor

The sensor is provided on both sides of cassette as shown below.

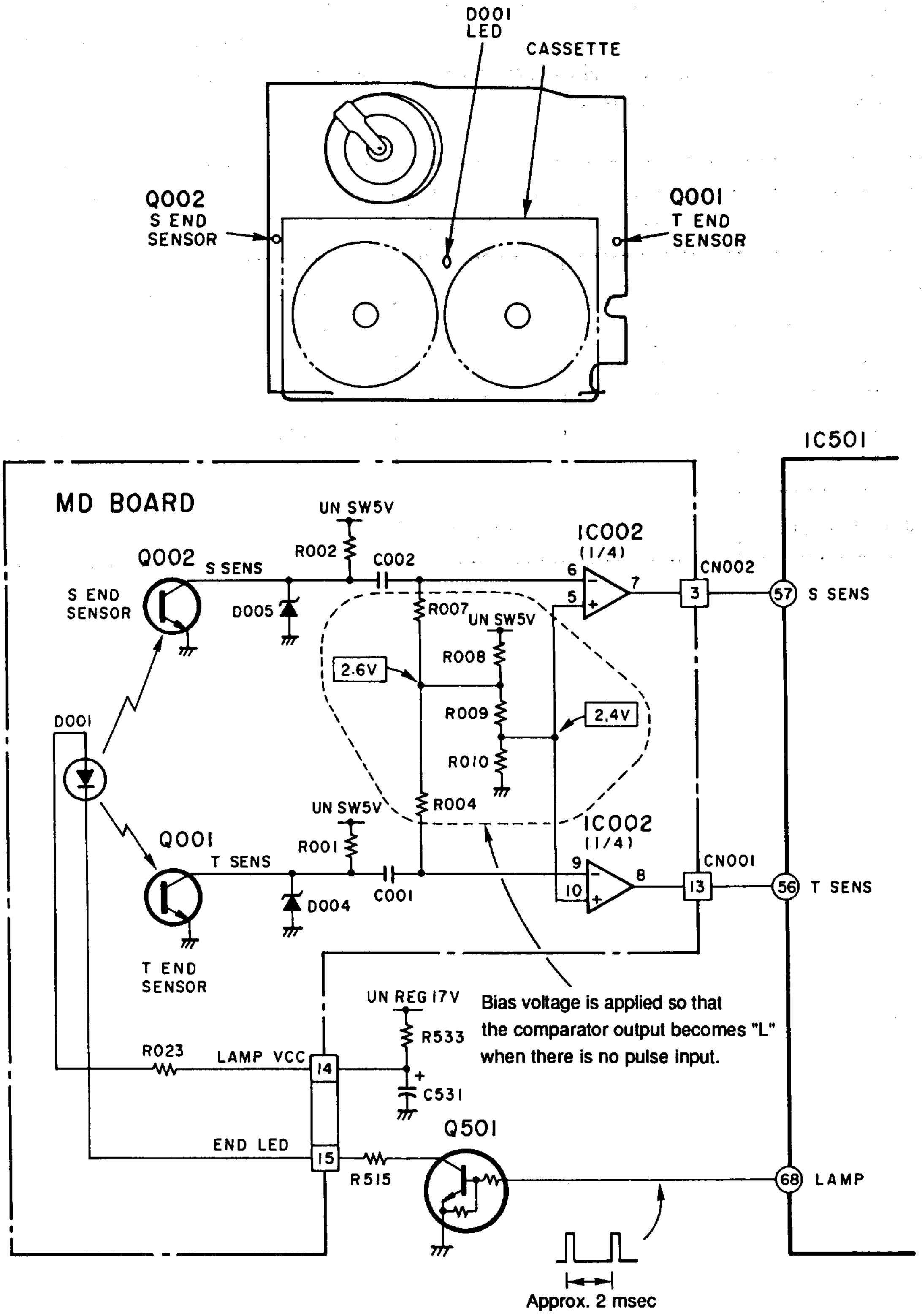

D001
LED
CASSETTE
Q002
S END
SENSOR
Q001
T END
SENSOR
IC501
MD BOARD
UN SW5V
Q002
S SENS
R002
C002
IC002
(1/4)
6
5
7
CN002
3
57
S SENS
S END
SENSOR
D005
R007
UN SW5V
R008
2.6V
R009
2.4V
R010
D001
UN SW5V
R004
Q001
R001
IC002
(1/4)
9
10
8
T SENS
CN001
13
56
T SENS
D004
C001
T END
SENSOR
UN REG 17V
R533
Bias voltage is applied so that the comparator output becomes "L" when there is no pulse input.
R023
LAMP VCC
14
C531
Q501
END LED
15
R515
68
LAMP
Approx. 2 msec

Fig. 2-17

The tape end lamp (D001) is an infrared light emission LED which comes on and goes off when Q502 is turned ON/OFF by the output from the pin (68) of the system control microprocessor IC501.

Unlike the Betamax system, the VHS system uses clear leader tape on each end of tape.

Therefore, the light of LED is normally blocked by magnetized tape and hence both Q001 and Q002 are OFF.

When the tape reaches its end, the lights of LED is transmitted through the leader tape so Q001 or Q002 turns ON/OFF.

Tape run condition	IC501 pin (57) (S SENS)	IC501 pin (56) (T SENS)	Changeover mode
Normal run	L	L	Continuation of normal run
Tape end	PULSE	L	REWIND
Tape top	L	PULSE	Tape runs in normal direction until there is no pulse input on pin (56) after stop.
No tape of tape cut	PULSE	PULSE	EJECT

2-3-3. Reel Base Rotation Detection

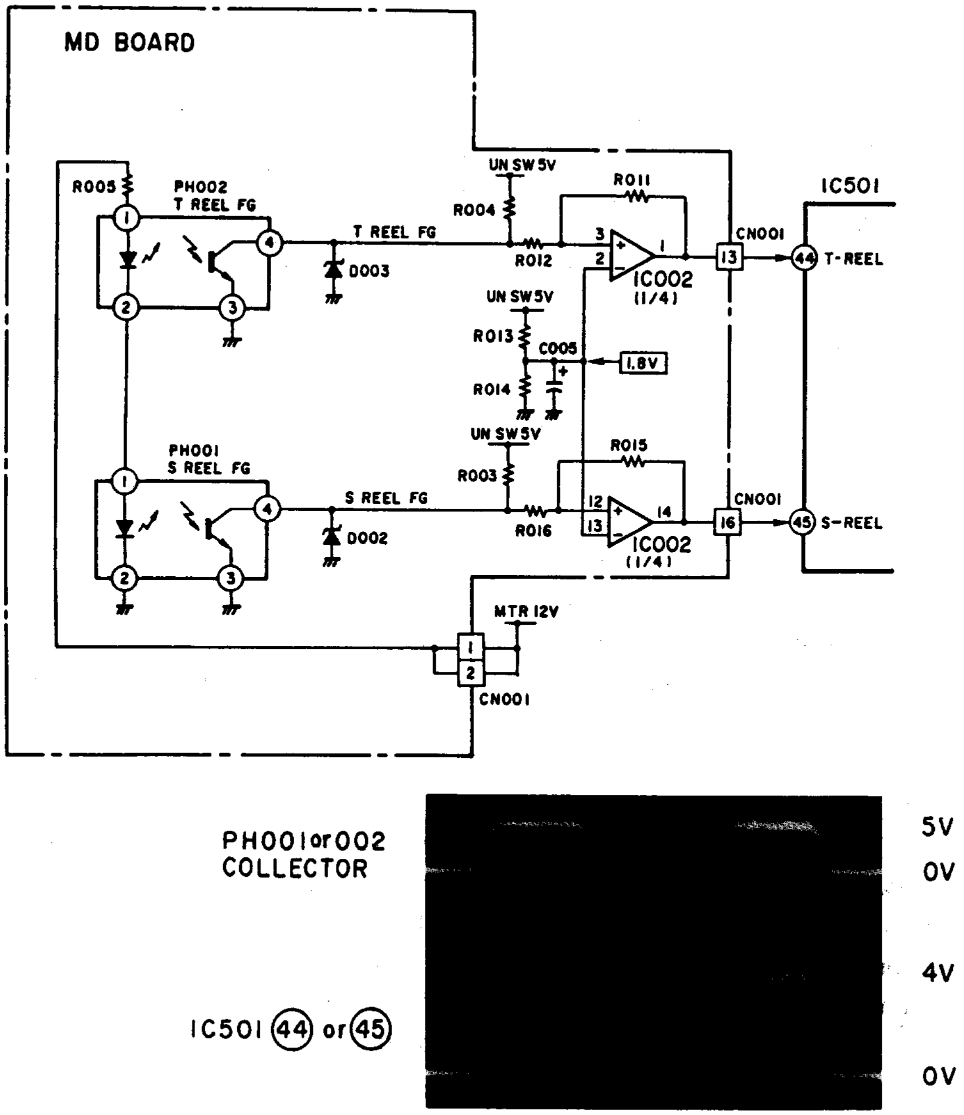

MD BOARD
R005
PH002
T REEL FG
T REEL FG
D003
UN SW 5V
R004
R011
R012
IC002
(1/4)
UN SW5V
R013
C005
R014
1.8V
PH001
S REEL FG
S REEL FG
D002
UN SW5V
R003
R015
R016
IC002
(1/4)
CN001
CN001
IC501
44 T-REEL
45 S-REEL
MTR 12V
CN001
PH001 or 002
COLLECTOR
IC501 ㊹ or ㊺
5V
0V
4V
0V

Fig. 2-18

Reel FG signal detects the rotation of the gear meshed between the S reel base and the T reel base. Six pulses are generated per rotation of the gear.

The system control microprocessor counts the cycles of the reel FG signal. When the counted cycle is larger than e values shown in the table below, the reel base is immediately set in STOP mode.

When it has stopped with this detection, no switches other than the POWER switch and EJECT switch can be used.

[Reel base rotation detection time out (Unit: Sec)]

Operation mode	PB/REC X1/-X1	X2/-X2	CUE/REV	FF/REW	SLOW
LP	4	2	0.2	0.5	100
SP	1.3	0.65	0.2	0.5	33

2-3-4. Drum Rotation Detection

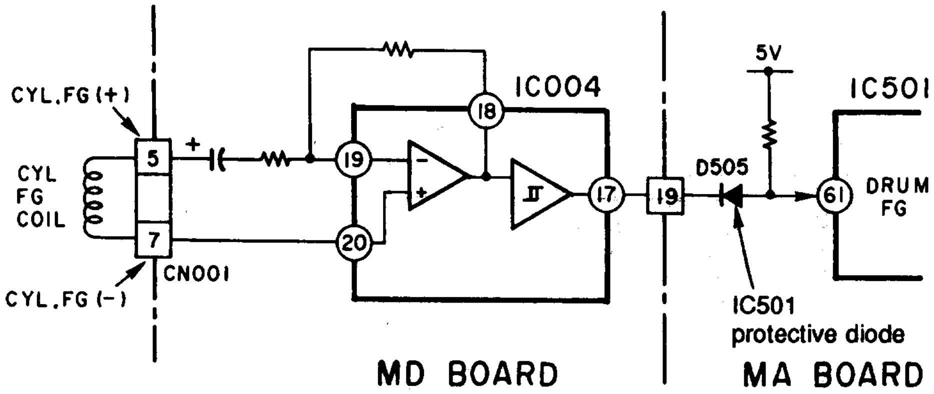

CYL.FG (+)
CYL FG COIL
5
7
CN001
CYL.FG (-)
IC004
18
19
20
17
19
5V
D505
IC501
61
DRUM FG
IC501 protective diode
MD BOARD
MA BOARD

Fig. 2-19

When the pulse interval of the drum FG signal inputted to IC501 pin (61) is more than 1.5 second, it is an indication that the drum rotation is abnormal. In this case, the drum is set in STOP mode.

(Twelve pulses are generated per rotation of the drum.)

[Drum control for quick action]

The drum keeps rotation even in STOP mode to shorten the time from STOP to REC/PB.

But, if no operation is made (no function input), the drum stops in 5 minutes in any of the following cases.

- No operation has been made for 5 minutes after cassette loading.

- No operation has been made for 5 minutes after changing to STOP mode from PB, REC, FF or REW.

No operation has been made for 5 minutes after power is turned ON under cassette loading condition.

2-3-5. Reel Hub Size Detection

Reel hub size is detected for the following purposes.

1. Indication of remaining amount of tape
2. Smooth stop at tape end or tape top during FF, REW or high speed REW, and prevention of large tension given to tape.

- Reel hub size is detected in PB, REC, FF, REW or high speed REW mode after cassette loading. During FF, REW, or high speed REW, reel hub size is detected in CUE/REVIEW mode and then tape is set in high speed run mode.
- Once the reel hub size is detected, its data are retained until the cassette is ejected.
- In detecting the reel hub size, the time (Ns) required to generate 6 S reel FG pulses and the time (Nt) required to generate 6 T reel FG pulses are counted under steady tape run condition.

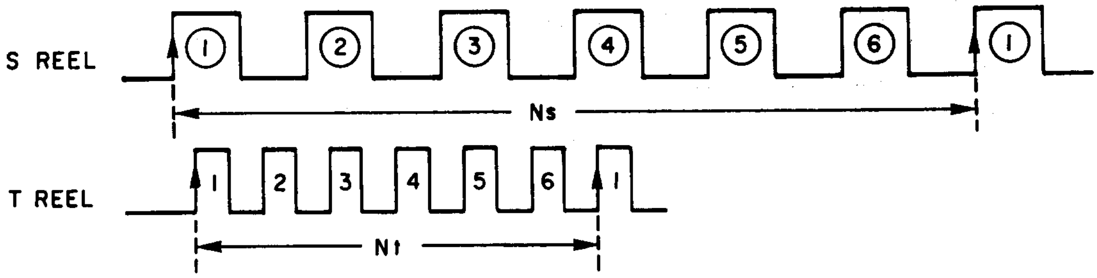


Fig. 2-20

2-3-6. Function Key Input Circuit (AD0-AD7)

5V is divided by resistors to reel key input by 6 stages (0-5V) of DC voltage. Key having a high priority order is on the top stage of the circuit.

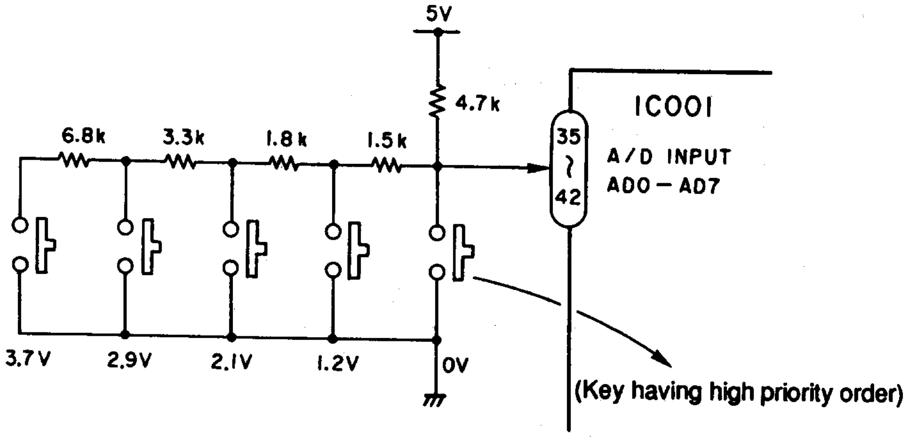

5V
4.7k
6.8k
3.3k
1.8k
1.5k
IC001
35
~
42
A/D INPUT
AD0 – AD7
3.7V
2.9V
2.1V
1.2V
0V
(Key having high priority order)

Fig. 2-21

[A/D port layout]

	1 0 V	2 1.2 V	3 2.1 V	4 2.9 V	5 3.7 V	OPEN 5 V
AD 0	RING 0*		(X120)	COMMAND MODE		
				VTR 1	VTR 2	VTR 3
AD 1	RING 1*					RING 1*
AD 2	RING 2*					RING 2*
AD 3	FWD/RVS*	PAUSE	SYSTEM 1 (B/G)	SYSTEM 2 (AUTO)		SYSTEM 3 (D/K)
AD 4	STOPPLAY*	POWER	EJECT			
AD 5	REC	TRACKING AUTO/ MANUAL	TRACKING –	CHANNEL +		
AD 6	HIGH SPEED REWIND	QUICK TIMER	TRACKING +	CHANNEL –		
AD 7		TIMER REC ON/OFF	INPUT SELECT	EDIT		

*: SHUTTLE SEARCH DIAL

2-3-7. Shuttle Search Dial

This shuttle search dial is a kind of rotary switch and is not provided with a photo sensor.

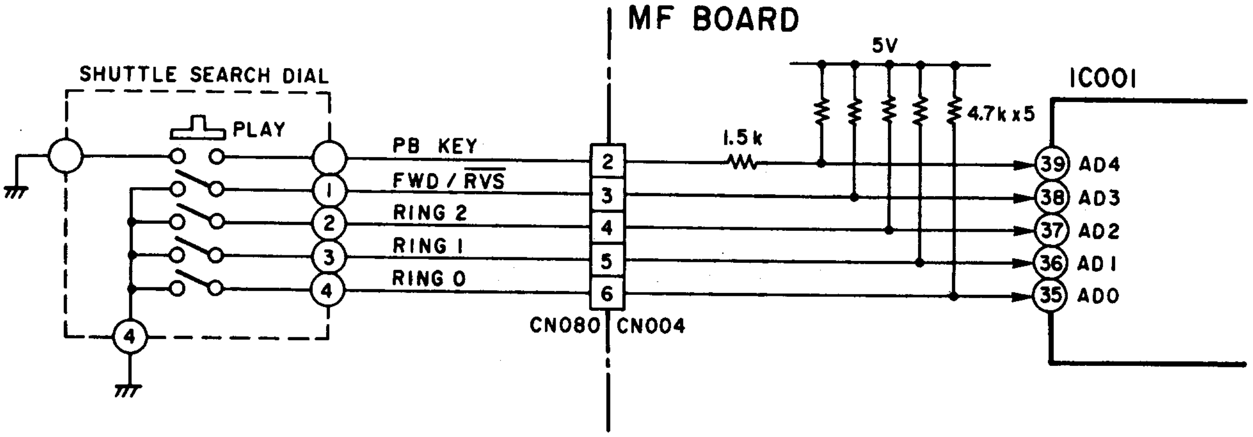

MF BOARD
5V
SHUTTLE SEARCH DIAL
PLAY
IC001
4.7k x5
1.5k
PB KEY
FWD / RVS
RING 2
RING 1
RING 0
2
3
4
5
6
1
2
3
4
4
CN080
CN004
39 AD4
38 AD3
37 AD2
36 AD1
35 AD0

Fig. 2-22

[Signal level]

MODE	REW											FF			
SIGNAL	REVIEW		-X2	-X1	-1/5		STILL		1/5		X1	X2	CUE		
RING 0	L		L	H	H		H		H		H	L	L		H = 2.9V or 3.7V or 5V
RING 1	H	L	H	H	L		H		L		H	H	L	H	H = 5V
RING 2	H	L	L	L	L	H	H		H	L	L	L	L	H	H = 5 V
FWD/RVS	L		L	L	L		L	H	H		H	H	H		H = 2.1V or 2.9V or 5V

2-3-8. Buzzer Control

The buzzer sounds at the time of reservation transfer or menu alarm.

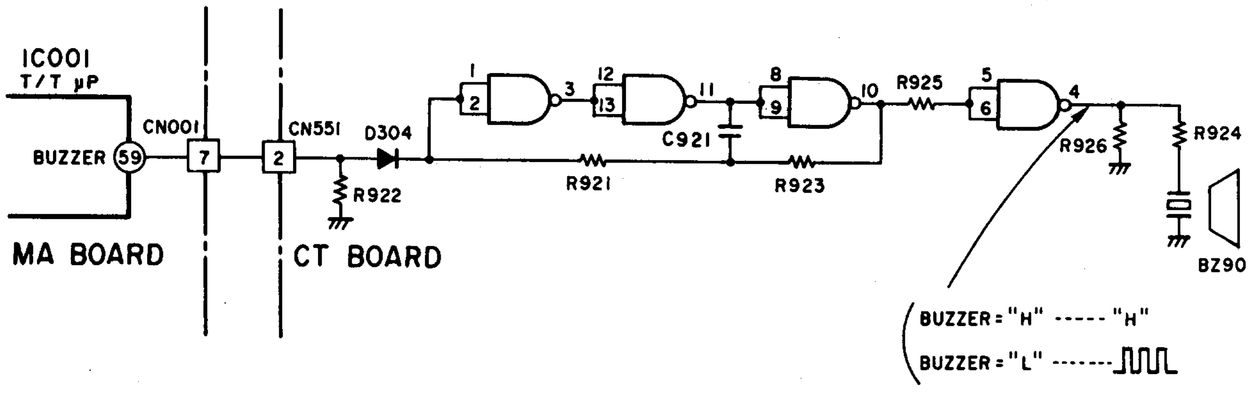

IC001
T/T µP
BUZZER 59
CN001
7
CN551
2
D304
R922
MA BOARD
CT BOARD
1
2
3
12
13
11
C921
8
9
10
R925
5
6
4
R921
R923
R926
R924
BZ901
BUZZER = "H" ----- "H"
BUZZER = "L" -------

Fig. 3-23

IC921 is an oscillator circuit (Approx. 4.5 kHz). When the buzzer signal at IC001 pin ㊾ output is "H", IC921 pins ① , ② are set in "H" level so the oscillator circuit is not operating. When the buzzer signal is "L", the signal feedback by R921 is effected and hence the circuit oscillates 4.5 kHz (approx.).

2-3-9. Tuner Control

The tuner receiving band is selected by 3 signals of VL, VH and U, while the receiving frequency s selected by VC PWM signal which is converted into analog signal by Q708 and 707 and inputted to the VC terminal of the tuner unit. The T/T µP performs AFT action by changing VC PWM signal while observing AFT UP/DOWN signal.

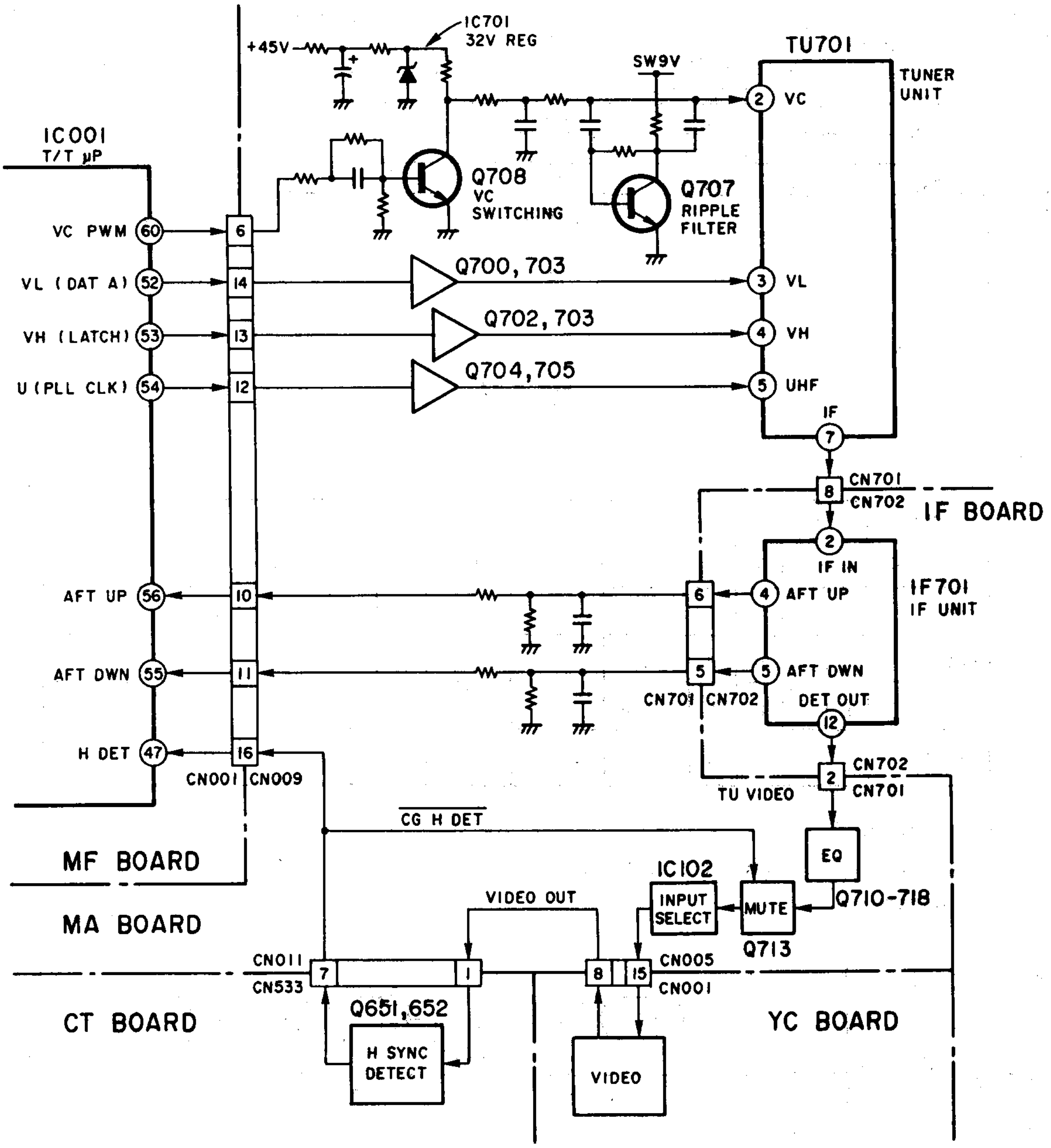

IC701
32V REG
+45V
SW9V
TU701
TUNER UNIT
IC001
T/T µP
VC PWM 60
VL (DAT A) 52
VH (LATCH) 53
U (PLL CLK) 54
Q708
VC SWITCHING
Q707
RIPPLE FILTER
Q700, 703
Q702, 703
Q704,705
2 VC
3 VL
4 VH
5 UHF
IF
7
CN701
CN702
IF BOARD
IF IN
AFT UP
AFT DWN
IF701
IF UNIT
DET OUT
AFT UP 56
AFT DWN 55
H DET 47
CN001
CN009
CN701
CN702
TU VIDEO
CG H DET
MF BOARD
MA BOARD
IC102
INPUT SELECT
MUTE
EQ
Q710-718
Q713
VIDEO OUT
CN011
CN533
CN005
CN001
CT BOARD
Q651,652
H SYNC DETECT
VIDEO
YC BOARD

Fig. 2-24

Broadcast signals is detected by H DET signal obtained by H SYNC of video signal. When there is no broadcast signal and the H DET signal is "H" level, the audio signal is muted a blue back signal is output as a video signal.

2-3-10. IC001 Memory I/O Terminal

IC702 stores tuner preset data in memory, holding the data even when the AC receptacle is disconnected (non-volatile memory).

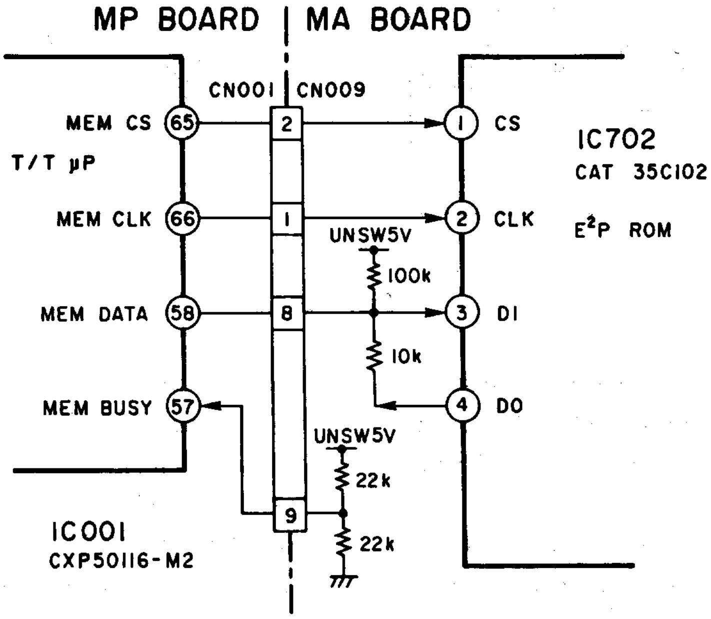

MP BOARD
MA BOARD
CN001
CN009
MEM CS
T/T μP
MEM CLK
MEM DATA
MEM BUSY
65
66
58
57
2
1
8
9
UNSW5V
100k
10k
UNSW5V
22k
22k
1
2
3
4
CS
CLK
DI
DO
IC702
CAT 35C102
E²P ROM
IC001
CXP50116-M2

Fig. 2-25

Memory write/read is effected when CS signal on IC001 pin (65) is output and its clock is ECLK of IC001 pin (66) output.

The MEM data on IC001 pin (58) functions as bidirectional input and output, and it becomes an out put port at memory write to send data to DI of IC702 pin ③.

Also, IC001 pin (58) is used as an input port at memory read for reading data from D0 of IC702 pin ④.

2-3-11. SIRCS Circuit

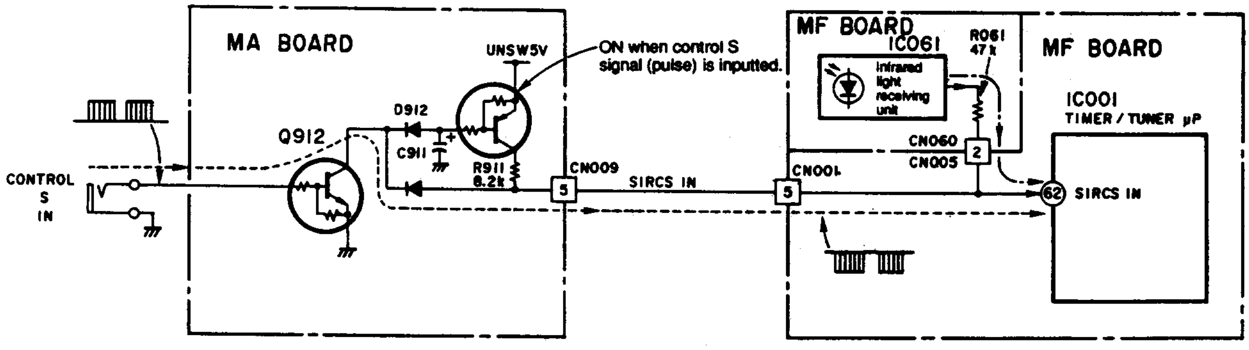

MA BOARD
UNSW5V
ON when control S signal (pulse) is inputted.
D912
Q912
C911
R911 8.2k
CN009
5
SIRCS IN
CONTROL S IN
MF BOARD
IC061
R061 47k
Infrared light receiving unit
CN060
CN005
2
CN001
5
MF BOARD
IC001
TIMER / TUNER µP
62
SIRCS IN

Fig. 2-26

[Selection of infrared remote control and control S]

When infrared remote control and control S signal are inputted at the same time, the control S input takes precedence over the other.

[Reception of infrared remote control signal]

Remote control signal received by IC061 passes through R061 and is inputted to the T/T microprocessor IC001. This this case,

Q912 is OFF so Q911 is also OFF, thus causing no effects on the infrared remote control signal.

[Input on control S terminal]

Q912 turns ON/OFF with the control S input signal. In this way, C911 is discharged and Q911 turns ON. When Q911 is ON, R911 becomes the collector load of Q912 and hence the control S input signal inverted by Q912 is inputted to the T/T microprocessor.

At this time, Q911 is ON even when the infrared remote control signal is inputted, so the output signal (5Vp-p) on the infrared light receiving unit is attenuated to about 1/20 by R061 and R911, causing no effects on the remote control signal.

SECTION 3. VIDEO CIRCUIT

3-1. GENERAL

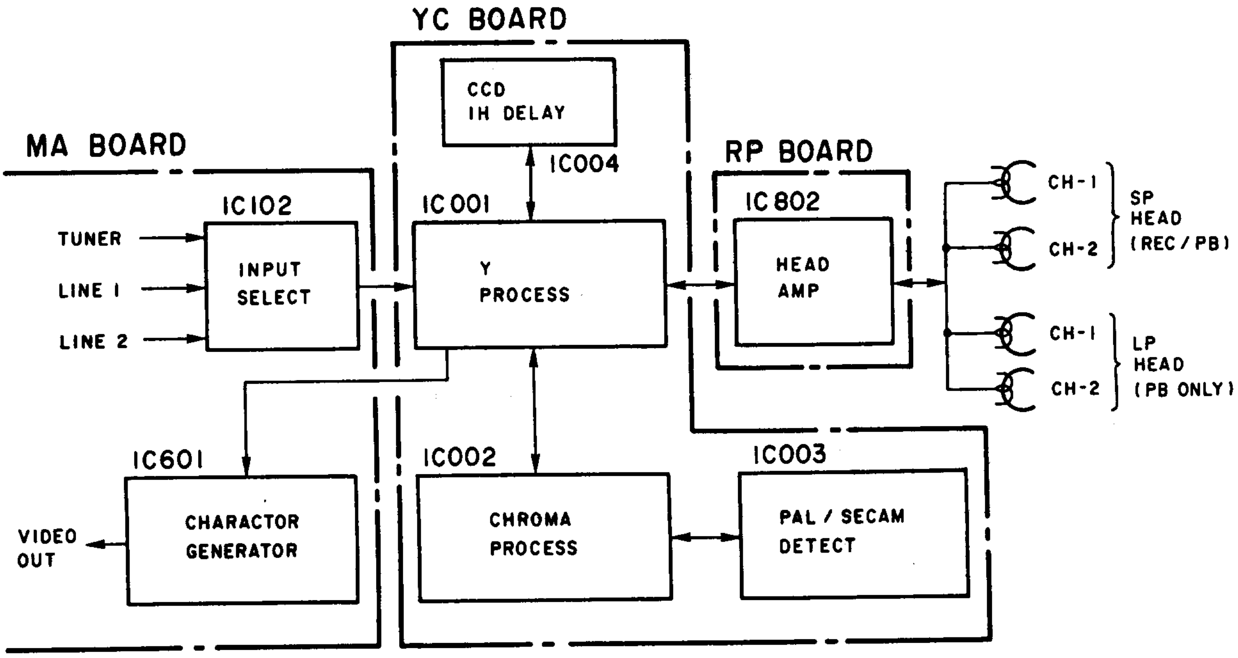

YC BOARD
CCD
1H DELAY
IC004
MA BOARD
RP BOARD
IC102
IC001
IC802
TUNER
LINE 1
LINE 2
INPUT
SELECT
Y
PROCESS
HEAD
AMP
CH-1
CH-2
SP
HEAD
(REC/PB)
CH-1
CH-2
LP
HEAD
(PB ONLY)
IC601
IC002
IC003
VIDEO
OUT
CHARACTOR
GENERATOR
CHROMA
PROCESS
PAL / SECAM
DETECT

Fig. 3-1

The video circuit is composed as shown in Fig. 3-1. The IC used in this circuit functions in both the recording and playback modes by means of the internal switch.

3-2. INPUT SELECT CIRCUIT

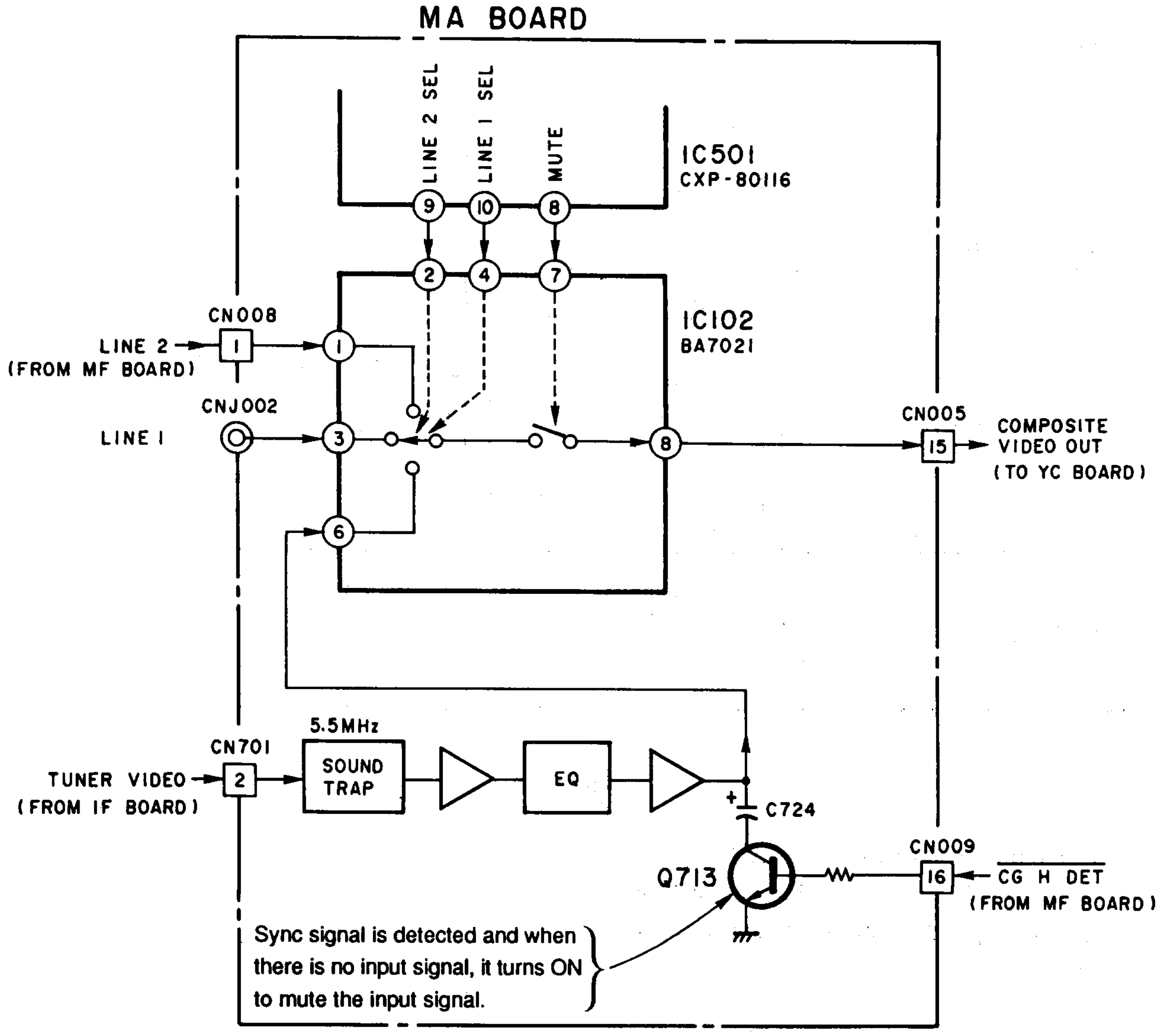

MA BOARD
LINE 2 SEL
LINE 1 SEL
MUTE
IC501
CXP-80116
9
10
8
2
4
7
IC102
BA7021
CN008
LINE 2
(FROM MF BOARD)
1
CNJ002
LINE 1
3
6
8
CN005
15
COMPOSITE
VIDEO OUT
(TO YC BOARD)
5.5MHz
CN701
TUNER VIDEO
(FROM IF BOARD)
2
SOUND
TRAP
EQ
C724
Q713
CN009
16
CG H DET
(FROM MF BOARD)
Sync signal is detected and when there is no input signal, it turns ON to mute the input signal.

Fig. 3-2

Tuner and line input signals are selected by IC102 and the selected signal is output from pin ⑧.

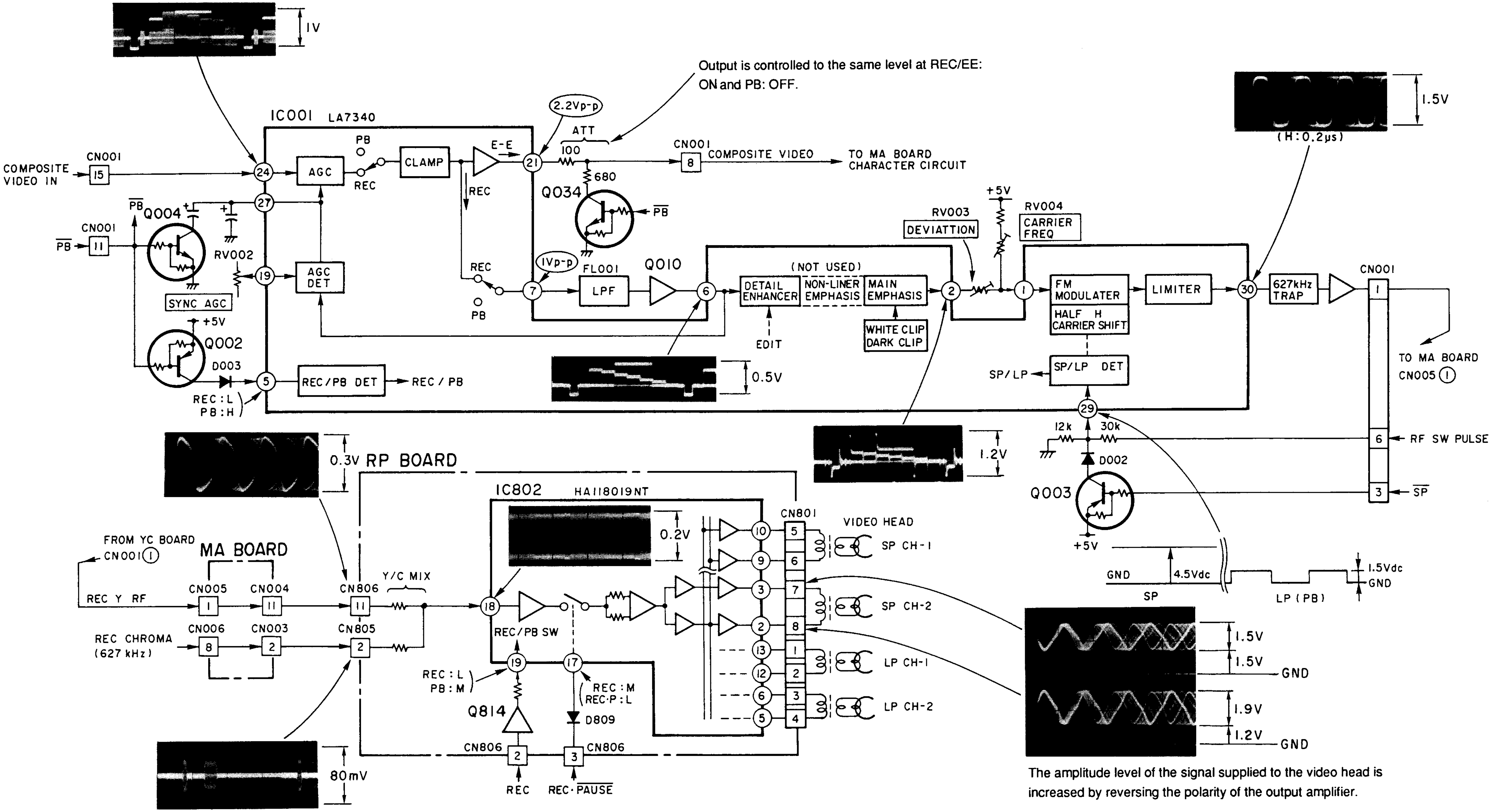
[Input select signal]

SIG. / MODE	LINE 2 SEL	LINE 1 SEL
TUNER	L	L
LINE 1	L	H
LINE 2	H	L

[Mute signal]

Turns to "H" in playback mode when input signal is OFF.

3-3. E-E/Y REC CIRCUIT


1V
IC001 LA7340
COMPOSITE VIDEO IN
CN001 15
CN001 11
PB
Q004
RV002
SYNC AGC
+5V
Q002
D003
REC : L
PB : H
24
27
19
5
AGC
AGC DET
REC/PB DET
REC / PB
PB
REC
CLAMP
E-E
REC
2.2Vp-p
ATT
100
21
680
Q034
1Vp-p
7
FL001
LPF
Q010
6
CN001 8
COMPOSITE VIDEO
TO MA BOARD CHARACTER CIRCUIT
(NOT USED)
DETAIL ENHANCER
NON-LINER EMPHASIS
MAIN EMPHASIS
EDIT
WHITE CLIP DARK CLIP
0.5V
RV003
DEVIATTION
+5V
RV004
CARRIER FREQ
2
1
FM MODULATER
HALF H CARRIER SHIFT
LIMITER
30
627kHz TRAP
1.5V
(H:0.2µs)
CN001
TO MA BOARD CN005 ①
SP/LP DET
SP/LP
29
12k
30k
D002
Q003
+5V
RF SW PULSE
SP
1.2V
0.3V
RP BOARD
IC802 HA118019NT
0.2V
CN801
VIDEO HEAD
SP CH-1
SP CH-2
LP CH-1
LP CH-2
10
9
3
2
13
12
6
5
FROM YC BOARD CN001①
MA BOARD
REC Y RF
CN005
CN004
CN806
Y/C MIX
REC CHROMA (627 kHz)
CN006
CN003
CN805
18
REC/PB SW
19
17
REC : L
PB : M
Q814
REC : M
REC·P : L
D809
CN806 2
3 CN806
REC
REC·PAUSE
80mV
GND
4.5Vdc
SP
LP (PB)
1.5Vdc
GND
1.5V
1.5V
GND
1.9V
1.2V
GND

Output is controlled to the same level at REC/EE: ON and PB: OFF.

The amplitude level of the signal supplied to the video head is increased by reversing the polarity of the output amplifier.

Fig. 3-3

3-3-1. Y Signal Recording Circuit

Composite video signal is output to pin ⑦ through the AGC circuit and the chroma signal is removed by LPF to pick up luminance signal (Y signal). The Y signal is inputted to pin ⑥ and is output to pin ② through the detail enhancer, non-linear emphasis and main emphasis circuits, where deviation and carrier frequencies are adjusted and inputted to pin ①. This signal is then modulated by FM modulator and is output to pin ㉚ through the limiter circuit. The FM modulated signal enters the trap circuit where the low chroma signal component which is mixed in the trap circuit is removed. The REC Y PF signal passes through the MA board and is inputted to the RP board. It is mixed with the low chroma signal converted by the RP board and is inputted to IC802 pin ⑱ where it is amplified, and then it is supplied to the SP video head. This unit cannot record in LP mode.

[AGC circuit]

This circuit uses SYNC AGC system to regulate the SYNC signal level.

[Detail enhancer]

Detail enhancer is used enhance the level of 3-4 MHz for clear display of the edges of playback picture.

Note:

- Enhanced signal cannot be set back to the original level during playback.
- Detail enhancer does not operate when EDIT is ON during recording.

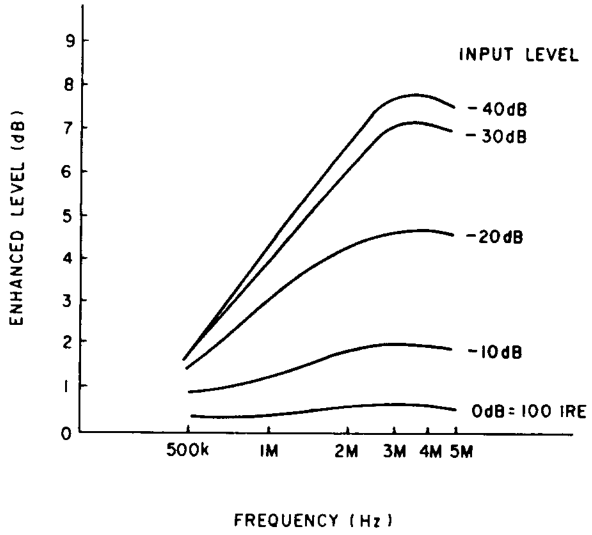


Fig. 3-4

As shown in Fig. 3-4, the amount of emphasis becomes large when the frequency is high or input signal level is small.

[Non-linear emphasis ... LP REC only (not used in this unit)]

If S/N ratio is improved only by increasing the amount of emphasis, an inversion phenomenon easily occurs during playback. The non-linear emphasis is used to improve the S/N ratio while holding the modulation rate at all times by changing the amount of emphasis according to the signal level.

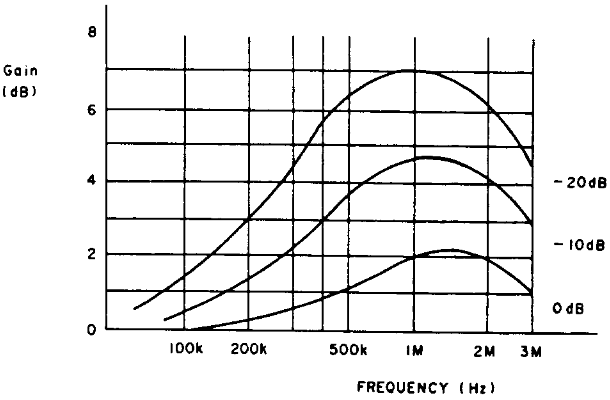


Fig. 3-5

[Main emphasis]

This circuit is used to emphasize the level of high frequency component during recording to reduce the noise which is produced when FM signal is modulated at the time of playback.

The amount of emphasis is constant regardless of the level of input signal.

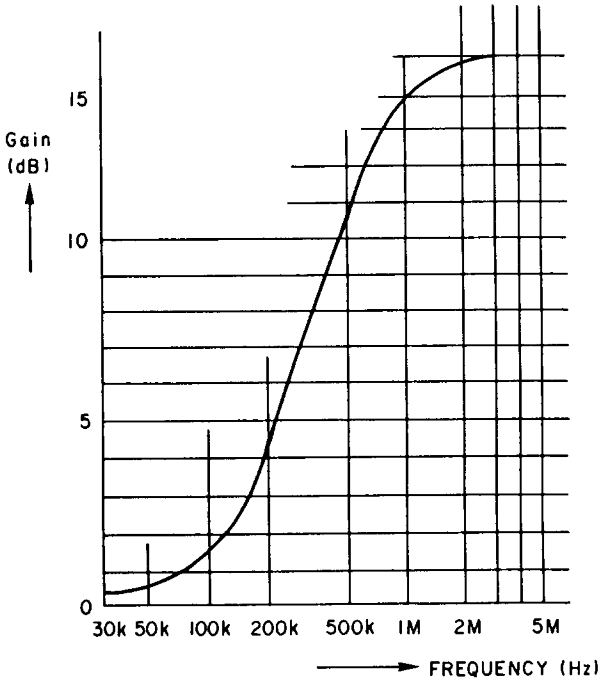
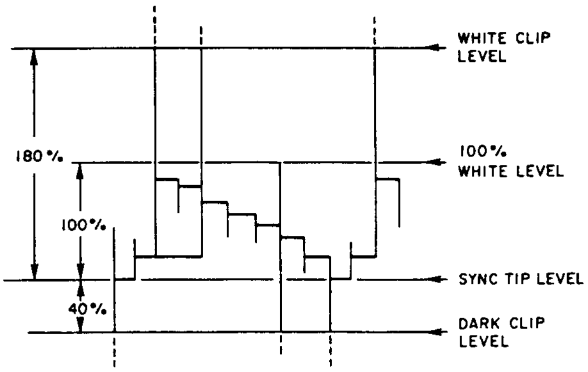


Fig. 3-6

[White clip/dark clip, FM modulation]

This circuit is used to clip a spike (overshoot, undershoot produced in the emphasis circuit to prevent over-modulation.

WHITE CLIP LEVEL:	180 %
DARK CLIP LEVEL:	40 %
SYNC TIP FREQ.:	3.8 MHz
WHITE PEAK FREQ.:	4.8 MHz
DEVIATION:	1 MHz



WHITE CLIP LEVEL
180 %
100 % WHITE LEVEL
100 %
SYNC TIP LEVEL
40 %
DARK CLIP LEVEL

Fig. 3-7

3-3-2. Y Signals Playback Circuit (1) .. Head amplifier

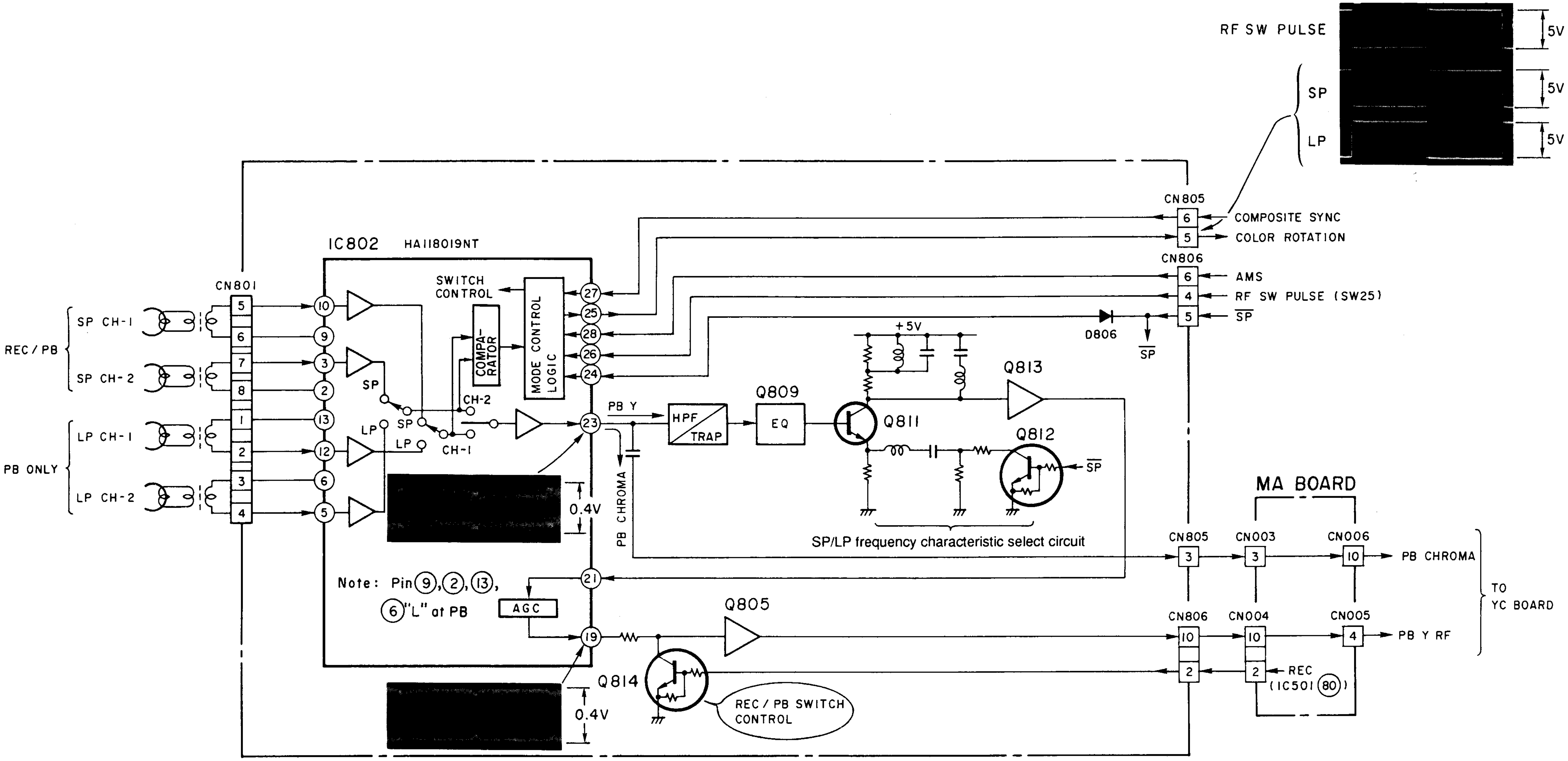
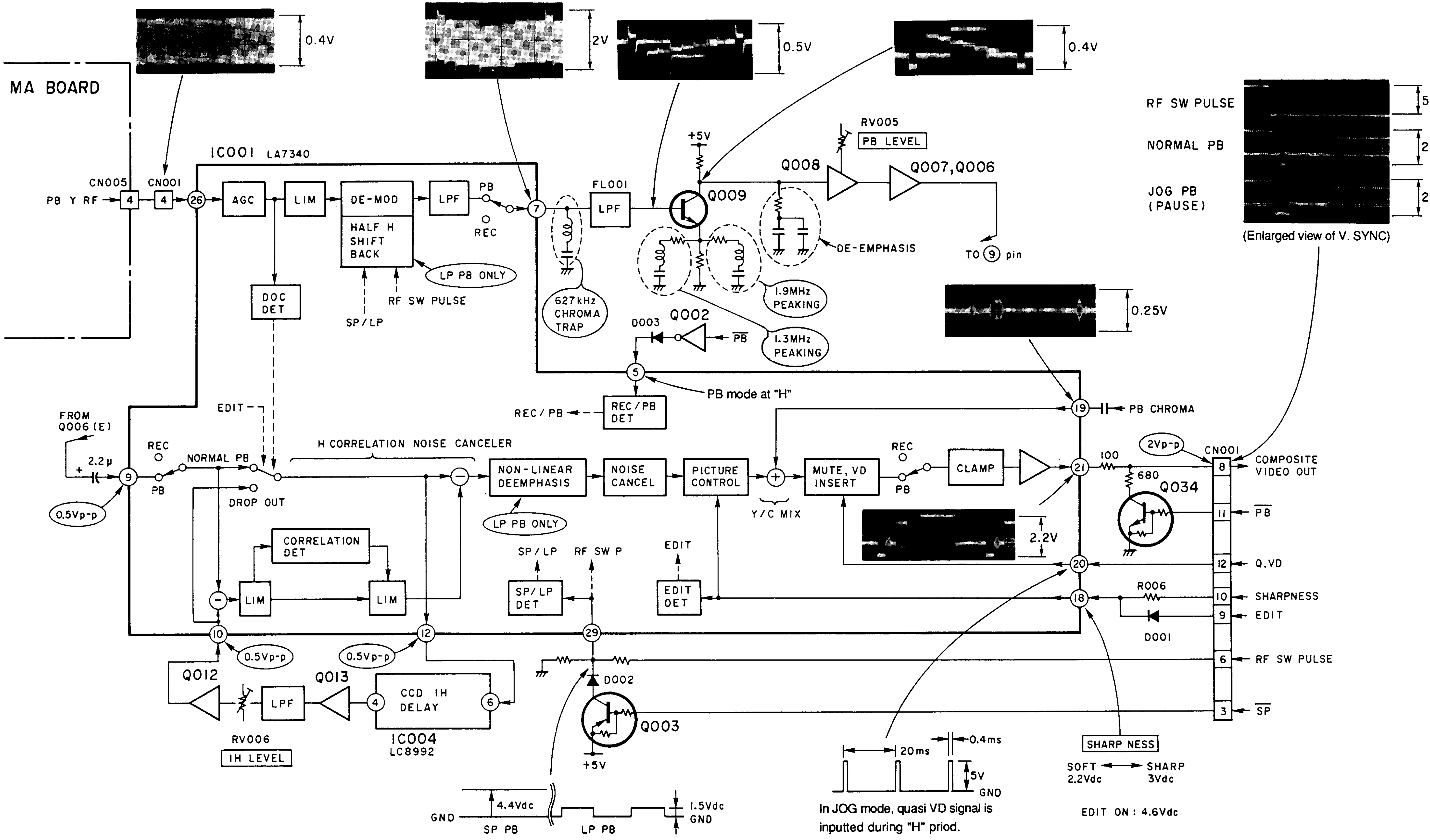

RF SW PULSE
5V
SP
5V
LP
5V
CN805
6
5
COMPOSITE SYNC
COLOR ROTATION
CN806
6
4
5
AMS
RF SW PULSE (SW25)
SP
D806
SP
IC802 HA118019NT
CN801
REC/PB
SP CH-1
SP CH-2
PB ONLY
LP CH-1
LP CH-2
5
6
7
8
1
2
3
4
10
9
3
2
13
12
6
5
SWITCH CONTROL
COMPA-RATOR
MODE CONTROL LOGIC
27
25
28
26
24
23
21
19
SP
LP
SP
LP
CH-2
CH-1
PB Y
PB CHROMA
0.4V
HPF
TRAP
Q809
EQ
+5V
Q811
Q813
Q812
SP
SP/LP frequency characteristic select circuit
Note: Pin⑨,②,⑬,⑥"L" at PB
AGC
Q805
Q814
0.4V
REC / PB SWITCH CONTROL
MA BOARD
CN805
CN003
CN006
3
3
10
PB CHROMA
CN806
CN004
CN005
10
10
4
PB Y RF
2
2
REC (IC501 ㊿)
TO YC BOARD

Fig. 3-8

Playback signal from the video head is inputted to IC802 where SP/LP head is selected to produce a continued signal by the CH-1/CH-2 select switch which is selected by the control signal from the mode control logic circuit.

The signal output to pin ㉓ passes through HPF, TRAP, EQ and SP/LP frequency characteristic select circuit and is inputted to pin ㉑.
The output level is regulated by the AGC circuit and is output to pin ⑲. Q814 is OFF during playback and the voltage on pin ⑲ is set to 2.6 Vdc. IC802 is then selected to playback mode (Pin ⑲) for REC/PB selection and PB Y RF output terminal).

3-3-3. Y Signal Playback Circuit (2) ... Y Signal



0.4V
2V
0.5V
0.4V
MA BOARD
IC001 LA7340
CN005
CN001
PB Y RF
26
AGC
LIM
DE-MOD
HALF H SHIFT BACK
LPF
PB
REC
7
LP PB ONLY
RF SW PULSE
SP/LP
DOC DET
FL001
LPF
627kHz CHROMA TRAP
+5V
Q009
Q008
RV005
PB LEVEL
Q007,Q006
TO 9 pin
DE-EMPHASIS
1.9MHz PEAKING
1.3MHz PEAKING
D003
Q002
PB
5
PB mode at "H"
REC/PB
REC/PB DET
0.25V
RF SW PULSE
NORMAL PB
JOG PB (PAUSE)
5V
2V
2V
(Enlarged view of V. SYNC)
19
PB CHROMA
FROM Q006 (E)
2.2μ
9
0.5Vp-p
EDIT
REC
NORMAL PB
PB
DROP OUT
H CORRELATION NOISE CANCELER
NON-LINEAR DEEPHASIS
LP PB ONLY
NOISE CANCEL
PICTURE CONTROL
Y/C MIX
MUTE, VD INSERT
REC
PB
CLAMP
21
100
680
2Vp-p
CN001
8
COMPOSITE VIDEO OUT
Q034
11
PB
2.2V
CORRELATION DET
LIM
LIM
SP/LP
RF SW P
EDIT
SP/LP DET
EDIT DET
20
12
Q.VD
R006
18
10
SHARPNESS
9
EDIT
D001
10
0.5Vp-p
12
0.5Vp-p
29
6
RF SW PULSE
Q012
Q013
LPF
4
CCD 1H DELAY
6
D002
Q003
3
SP
RV006
1H LEVEL
IC004
LC8992
+5V
20ms
0.4ms
5V
GND
SHARP NESS
SOFT
2.2Vdc
SHARP
3Vdc
EDIT ON : 4.6Vdc
4.4Vdc
GND
SP PB
LP PB
1.5Vdc
GND

In JOG mode, quasi VD signal is inputted during "H" priod.

Fig. 3-9

[AGC]

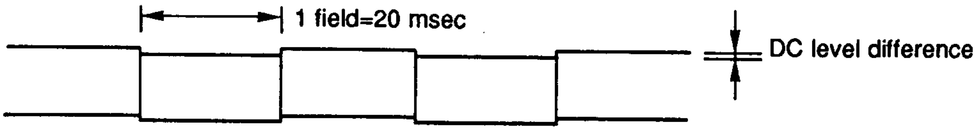
This circuit is used to regulate the playback RF signal level.

[Limiter]

This circuit is used to remove AM fluctuation and prevents inversion phenomenon.

[FM demodulation and half H shift return]

Signal is demodulated into the original video signal (Y signal). Since the FM modulated frequency has been shifted by half H (15.625 kHz/2 = 7.8 kHz) in CH-1 and CH-2 during LP recording, the DC level of the demodulated Y signal differs at each field.



DC level difference is removed by the half H shift return circuit to prevent flickering.

Fig. 3-10

[LPF ... FL001]

Unwanted signal contained in demodulated signal is removed and also demodulated signal is integrated to obtain video signal (Y signal).

[Drop-out compensator]

Playback Y REF signal is enveloped detected and when drop-out is detected, it is replaced with the signal 1H before.

DOC operation is inhibited in the EDIT mode.

[H correlation noise canceller]

Noise component is removed utilizing the correlation noise canceller is inhibited in the EDIT mode.

[Noise canceler]

High frequency component (regarded as noise) is picked up and signal component is removed through the limiter. Then, noise component is removed by adding the original Y signal in reverse phase.

[Picture control]

Picture quality can be changed between 'soft' and 'sharp' by adjusting the DC voltage on pin ⑱. In the EDIT mode, the picture quality is normal, regardless of the position of the SHARPNESS knob.

[MUTE, VD insert]

By setting the DC voltage on pin ⑳ to "H", quasi sync signal (Q. VD) can be inserted to video signal, preventing the vertical sync from distortion in the JOG mode such as STILL, PICTURE SEARCH (FWD/REVERSE SEARCH), etc.

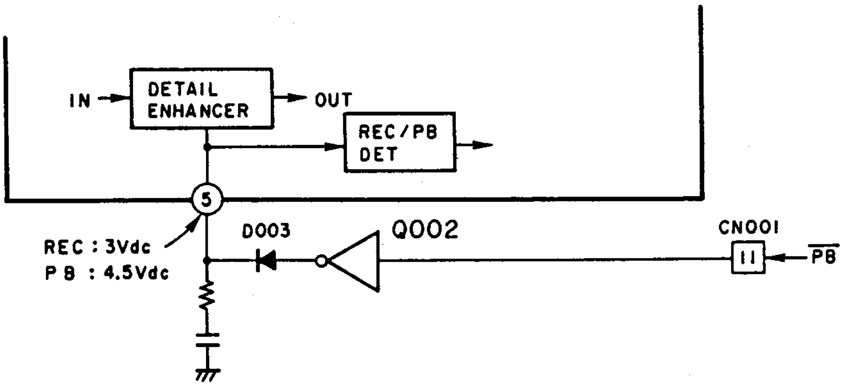
[Functions of IC001 LA7340 terminals]

Pin No.	Name	I/O	Function
1	FM MOD	I	Y signal input to FM modurator
2	MAIN EMP	O	Main emphasis output
3	EMP FB	I	Main emphasis feedback signal input
4	NL/DOC C	I	Non-linear emphasis filter and DOC inhibit signalinput (Note 1)
5	DETAIL	I	Detail ehancer filter and REC/PB select input (Note 2)
6	REC Y	I	REC Y signal input
7	Y OUT	O	REC/PB Y signal output
8	GND	–	
9	PB Y IN	I	PB Y signal input
10	Y_D IN I	I	1H delay signal input
11	CORR OUT	O	Correlation DET output (not used)
12	Y OUT	O	1H delay signal output
13	NL DE FIL	I	Non-linear deemphasis filter
14	NOICAN FL	I	Noise canceller filter (1)
15	NOICAN FL	I	Noise canceller filter (2)
16	S SEP FIL	I	Sync separator filter
17	COMP SYNC	O	Composite sync filter
18	PIC/EDIT	I	Picture control and edit input (Note 3)
19	PB C/AGC	I	PB chroma signal input and sync AGC control signal input (Note 4)
20	MUTE/QVD	I	Video signal mute and QVD signal insert (Note 5)
21	VIDEO OUT	O	Composite video signal output
22	VCC	I	+5 V

Pin No.	Name	I/O	Function
23	FBC FIL	I	Feedback clamp filter
24	VIDEO IN	I	Composite video signal input
25	AGC FIL	I	AGC filter (1)
26	PB Y RF	I	Playback Y RF signal input
27	AGC FIL	I	AGC filter (2)
28	DOC P	O	DOC pulse output (not used)
29	SWP/SP	I	RF SW pulse input and SP/LP mode select input (Note 6)
30	REC FM	O	REC FM signal output

Note 1: DOC (drop-out compensation control DOC stops operating when the voltage on pin ④ is more than 3.6V. In this unit, DOC ON/OFF is controlled at pin ⑱. DOC turns OFF when the pin ⑱ is set to "H" for EDIT MODE.

Note 2: REC/PB mode control



PB mode is detected when the voltage on pin ⑤ is more than 3.9V. When the voltage is "L", REC mode is detected.

Pin ⑤ waveform

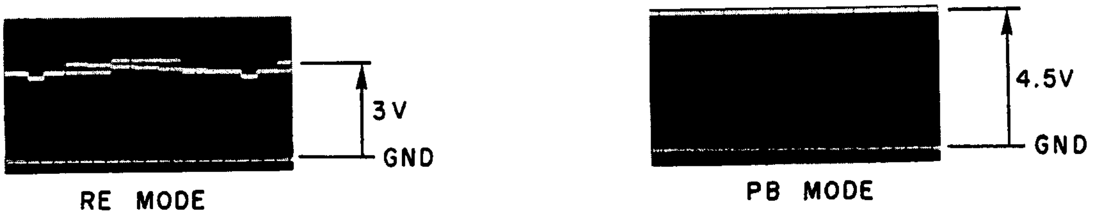


Fig. 3-11

Note: 3: Picture control, EDIT ON/OFF

Playback picture quality is changed between 'soft' and 'sharp' by adjusting the voltage on pin ⑱.

For EDIT mode, set the voltage on pin ⑱ to more than 3.6V.

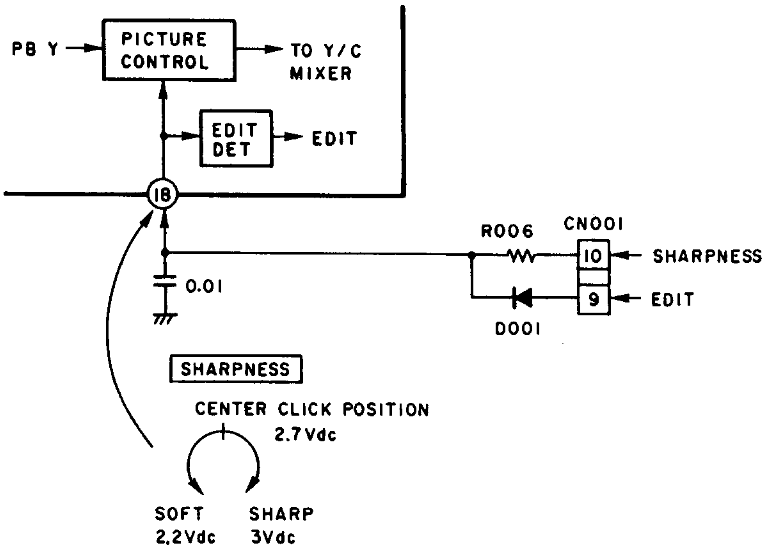

PB Y
PICTURE CONTROL
TO Y/C MIXER
EDIT DET
EDIT
18
R006
CN001
10
SHARPNESS
9
EDIT
D001
0.01
SHARPNESS
CENTER CLICK POSITION
2.7Vdc
SOFT
2.2Vdc
SHARP
3Vdc

Fig. 3-12

In the EDIT mode, the operation is changed as follows.

- PB mode
  1) Stops the operation of the H correlation noise canceller.
  2) Sharpness returns to center characteristic.
  3) The effect of noise canceller is reduced.
- REC mode
  Stops the operation of detail enhancer.

Note 4: Sync AGC gain control

Chroma signal is inputted to pin ⑲ during playback, while the gain of AGC amplifier is controlled during recording.

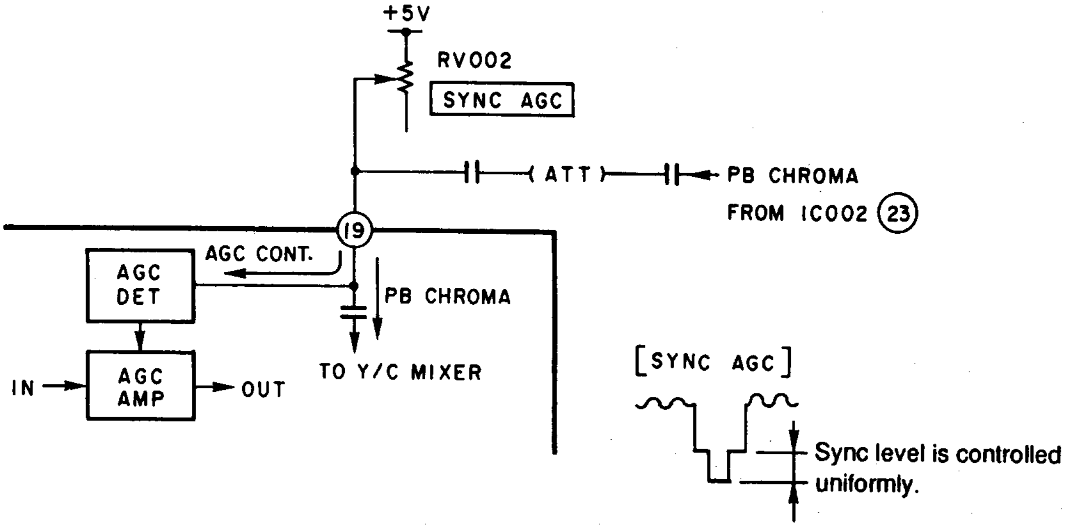

+5V
RV002
SYNC AGC
ATT
PB CHROMA
FROM IC002 ㉓
⑲
AGC CONT.
AGC DET
PB CHROMA
IN
AGC AMP
OUT
TO Y/C MIXER
[SYNC AGC]
Sync level is controlled uniformly.

Fig. 3-13

Note 5: Video signal mute and quasi VD signal insert

By controlling the voltage on pin ⑳ in 3 values (L/M/H) during STOP-PB JOG mode playback, video signal is muted and quasi VD signal is inserted. In this unit, the voltage is controlled in 2 values (L/H) and video signal is muted by blue picture using the character generator.

Pin ⑳ voltage

"L" (1.5V or less) ········ Input signal is output as it is.

"M" (1.9–3.2V) ············ Pedestal clamp (mute) ··· Not used in this unit

"H" (3.6V or more) ····· Sync tip clamp (sync signal insert)

Note 6: SP/LP mode control

LP mode is obtained when the voltage on pin ㉙ is less than 1.8V, and SP mode at more than 2.0V.

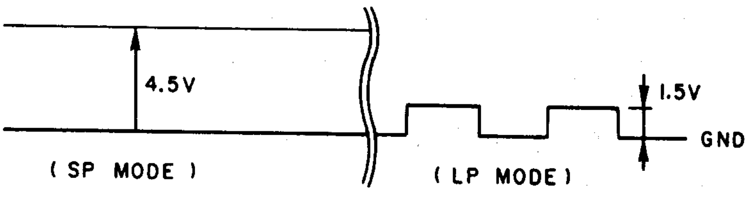

4.5V
(SP MODE)
(LP MODE)
1.5V
GND

Fig. 3-14

[Functions of IC802 HA118019NT terminals]

Pin No.	Name	I/O	Function
1	PB f SP	I	PB PRE AMP frequency characteristic (SP CH-2)
2	REC SP OUT	O	REC: SP CH-2 (+) OUT, PB; "L" Note 1
3	REC/PB SP	I/O	REC: SP CH-2 (–) OUT, PB: SP CH–2 RF IN (Note 1)
4	GND	–	GND
5	REC/PB LP	I/O	REC: LP CH-2 (+) OUT, PB: LP CH-2 RF IN (Note 1)
6	REC EP OUT	O	REC: LP CH-2 (–) OUT, PB: "L" (Note 1)
7	PB f LP	I	PB PRE AMP frequency characteristic (LP-CH-2)
8	PB f SP	I	PB PRE AMP frequency characterisitc (SP CH-2)
9	REC SP OUT	O	REC: SP CH-1 (+) OUT, PB: "L" (Note 1)
10	REC/PB SP	I/O	REC: SP CH-1 (–) OUT, PB: SP CH-1 RF IN (Note 1)
11	GND		GND
12	REC/PB LP	I/O	REC: LP CH-1 (+) OUT, PB: LP CH-1 RF IN (Note 1)
13	REC LP OUT	O	REC: LP CH-1 (–) OUT, PB: "L" (Note 1)
14	PB f LP	I	PRE AMP frequency characteristic (LP CH-1)
15	PRE AMP VCC	I	PRE AMP +5 V
16	EQ	I	REC: EQ, PB: HEAD SELECT (Note 2)
17	REC. P	I	REC PAUSE CONTROL
18	REC SIG.	O	REC signal (Y RF + Chroma) input
19	AGC OUT, REC/PB CONTROL	I/O	PB Y RF OUT, and REC/PB control IN (Note 3) M: PB MODE, L: REC MODE
20	T. C	–	AGC TIME CONSTANT
21	AGC IN	I	PB Y RF IN

Pin No.	Name	I/O	Function
22	GND	-	GND
23	PB RF	O	PB RF OUT
24	LP/$\overline{SP}$	I	SP/LP selection H: LP MODE, L: SP MODE
25	C-ROT	O	COLOR ROTATION LP mode: Reverse phase to RF SW pulse SP mode: In-phase to RF SW pulse (Note 4)
26	SW 30	I	RF SW PULSE (Note 5)
27	SYNC	I	COMPOSITE SYNC (Note 6)
28	A/M/S	I	AUTE/MANUAL/STILL (Note 7)
29	LP ENV	O	LP PB ENVENOPE Note) Not used
30	MAIN VCC	I	+5 V

Note 1: REC Amp output

This IC operates on Vcc=5V and hence a sufficient amplitude cannot be obtained. Therefore, the amplitude of the signal supplied to the video head is amplified by reversing the output polarity using 2 recording amplifiers.

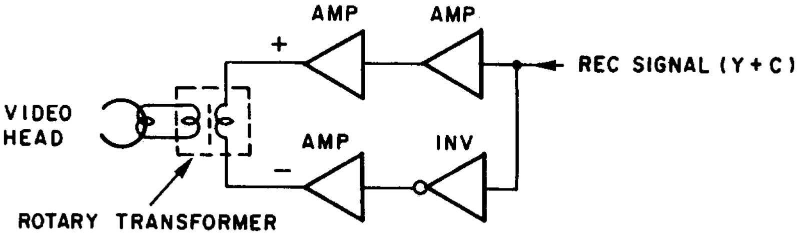
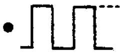


Fig. 3-15

Note 2:

REC mode: Determines the characteristic of the REC Amp circuit in IC by R826 and C827 connected to pin ⑯.

PB mode: Head select signal is connected through D808 to obtain the following characteristics in each mode.

Pin ⑯ voltage
- L (2.1V) ... Normal PB, PICTURE SEARCH, FWD/RVS x 1
- H (2.8V) .. STILL, FWD/RVS x 2
-  2.8V / 2.1V } SLOW

Note 3: REC/PB control

This IC 9HA118019NT) can be used in REC/PB mode.

Selection of REC/PB mode is made by pin ⑲ .

L: REC mode... REC mode is obtained at less than 1.5 Vdc.

OPEN: PB mode..... PB Y RF signal is output through AGC circuit in PB mode.

Note 4: Color rotation

LP/SP head being used can be checked by this signal to determine the timing of the PS (phase shift) return circuit.

In the SP mode, the output signal is in-phase to RF SW pulse, and in LP mode, it is reverse in phase to RF SW pulse.

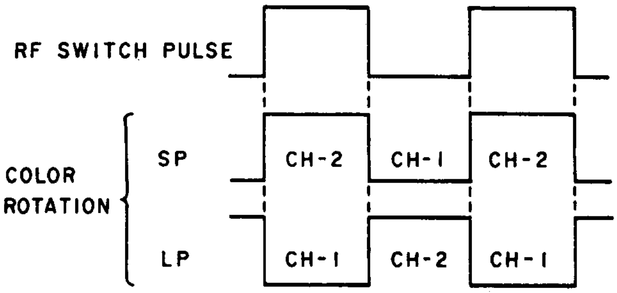
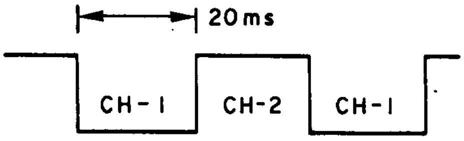


Fig. 3-16

Note 5: RF SW pulse

The head polarity in LP mode is different from that in SP mode.

[SP mode]



[LP mode]

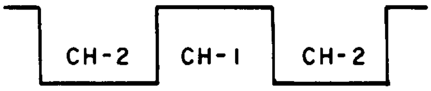


Fig. 3-17

Note 6: Composite sync

In the AUTO mode (see Note 7), the internal switch is selected for larger output. It is selected in H.SYNC period so that the switching noise does not appear in the picture.

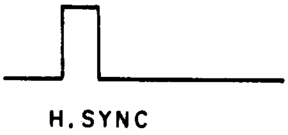


Fig. 3-18

Note: 7 A (auto)/M (manual)/S (slow)

Normally controlled in 3 values of L/M/S. In this unit, only 2 values of L/M are used.

L: Normal PB, STILL, FWD SLOW and FWD x 1 mode

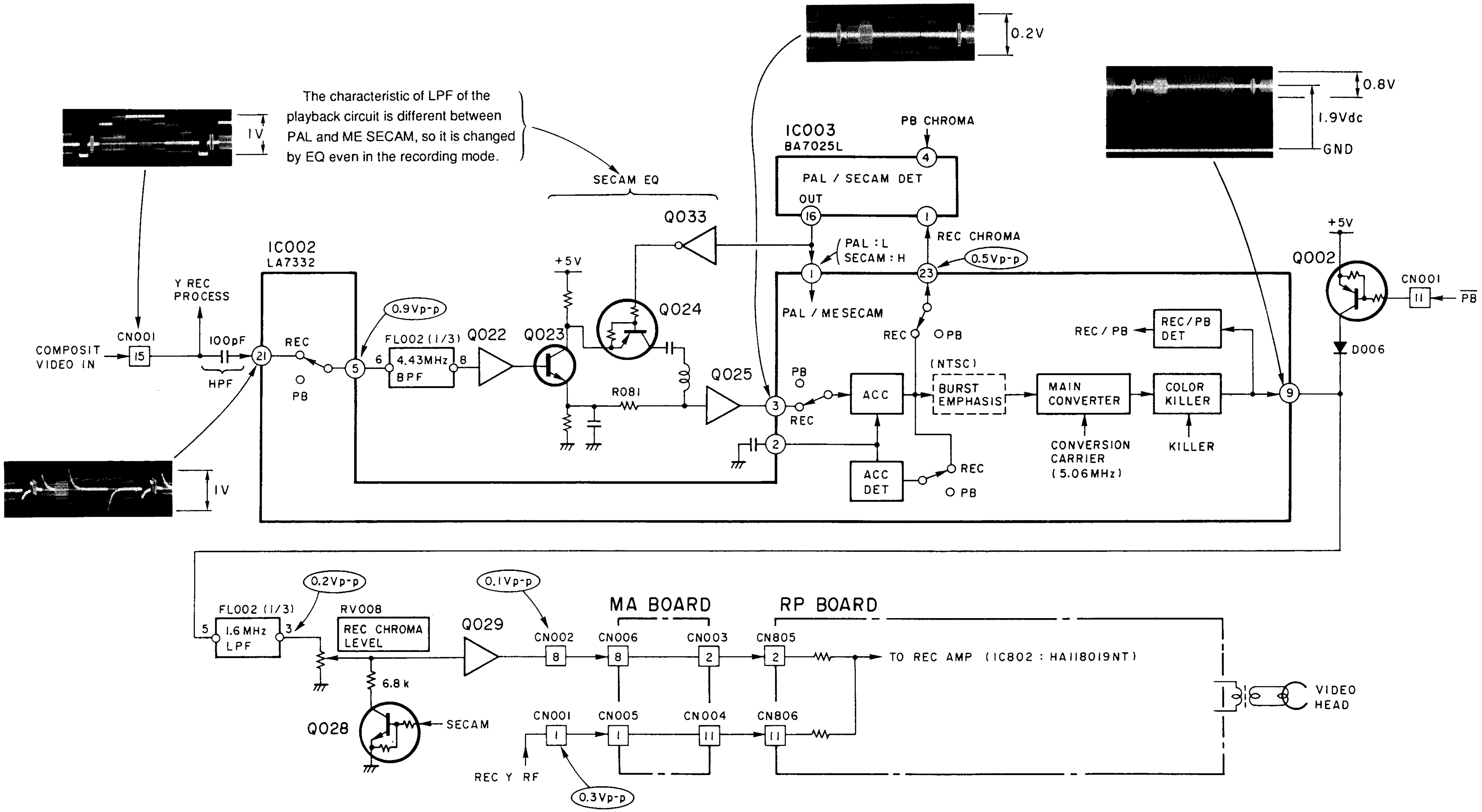
M: Picture search (FWD/REVIEW search), FWD/RVS x 2, RVS x 1 and RVS SLOW mode
In this unit, the Slow mode is effected by repeating (intermittent playback) PB and STILL modes. In these modes, a larger output is automatically selected.

Pin ㉘ voltage ↔ Mode

L (0V)...... SLOW
M (2.5V).. AUTO
H (5V)..... MANUAL

3-4. CHROMA SIGNAL CIRCUIT

3-4-1. Chroma Signal Recording Circuit


The characteristic of LPF of the playback circuit is different between PAL and ME SECAM, so it is changed by EQ even in the recording mode.

1V
0.2V
0.8V
1.9Vdc
GND
1V
SECAM EQ
IC003
BA7025L
PB CHROMA
PAL / SECAM DET
OUT
16
4
1
Q033
PAL : L
SECAM : H
REC CHROMA
0.5Vp-p
23
IC002
LA7332
+5V
Q002
CN001
11
PB
Y REC
PROCESS
COMPOSIT
VIDEO IN
CN001
15
100pF
HPF
21
REC
PB
0.9Vp-p
FL002 (1/3)
6
4.43MHz
BPF
8
5
Q022
Q023
Q024
Q025
R081
PAL / ME SECAM
REC
PB
REC / PB
REC/PB
DET
D006
(NTSC)
BURST
EMPHASIS
ACC
MAIN
CONVERTER
COLOR
KILLER
9
3
2
CONVERSION
CARRIER
(5.06MHz)
KILLER
ACC
DET
REC
PB
0.2Vp-p
0.1Vp-p
FL002 (1/3)
5
1.6MHz
LPF
3
RV008
REC CHROMA
LEVEL
Q029
MA BOARD
RP BOARD
CN002
CN006
CN003
CN805
8
8
2
2
TO REC AMP (IC802 : HA118019NT)
6.8k
Q028
SECAM
CN001
CN005
CN004
CN806
1
1
11
11
VIDEO
HEAD
REC Y RF
0.3Vp-p

Fig. 3-19

Chroma signal is separated by 4.43 MHz BPF (FL002). the PAL chroma signal from Q023 emitter passes through R081 and Q025 and is inputted to pin ③.

On the other hand, the SECAM chroma signal passes through the EQ circuit (this circuit operates at ON of Q024) and Q025, then it is inputted to pin ③.

The chroma signal inputted to pin ③ passes through the AGC circuit and is frequency con verted by the main converter, then it is output to pin ⑨ . The pin ⑨ also serves as input of REC/PB select signal (DC). IC002 operates in PB mode when the pin ⑨ is "H".

3-4-2. Chroma Signal Playback Circuit

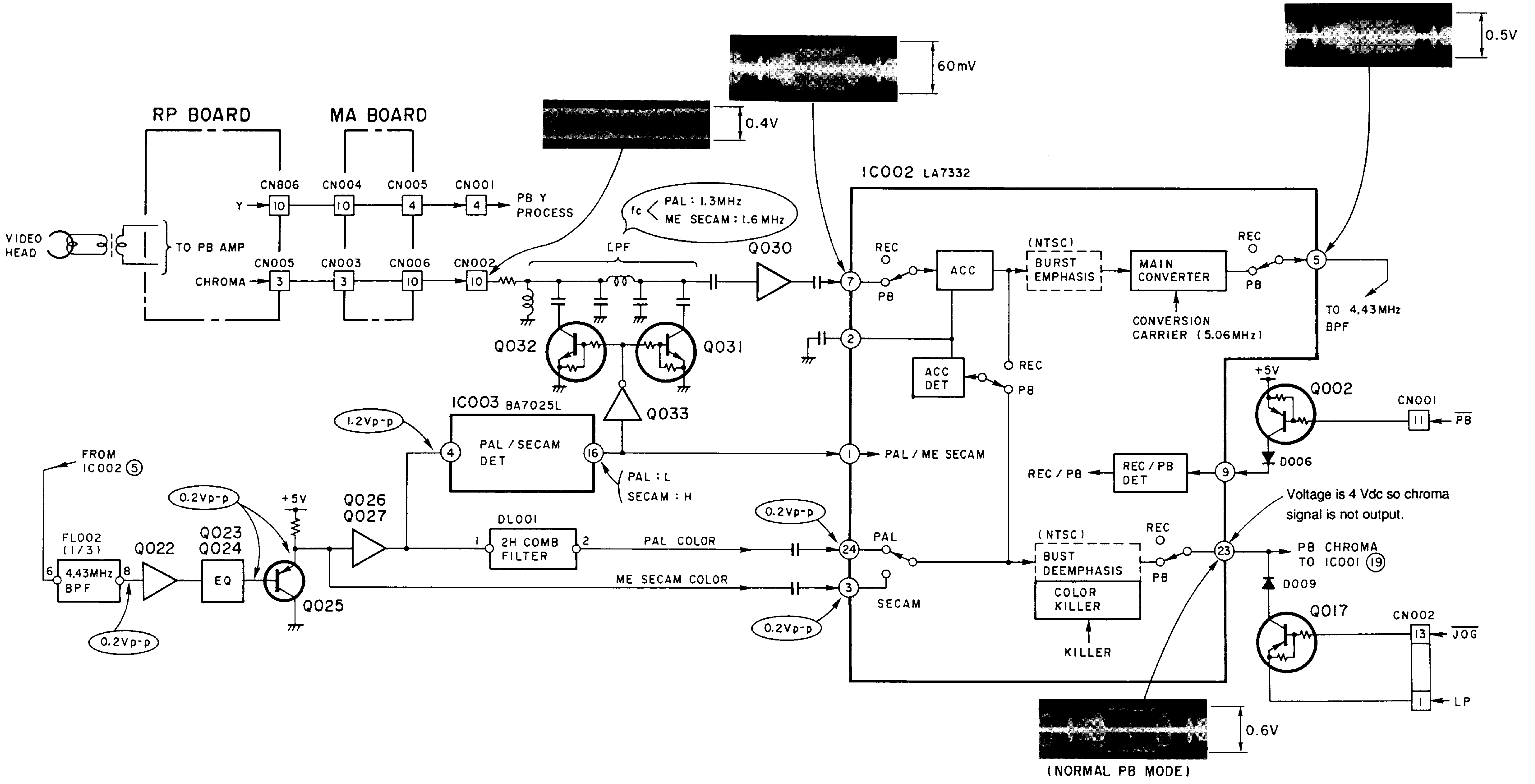

RP BOARD
MA BOARD
VIDEO HEAD
TO PB AMP
Y
CHROMA
CN806
CN004
CN005
CN001
CN005
CN003
CN006
CN002
10
4
3
PB Y PROCESS
0.4V
60mV
0.5V
fc PAL : 1.3MHz
ME SECAM : 1.6MHz
LPF
Q030
Q032
Q031
Q033
IC003 BA7025L
PAL / SECAM DET
1.2Vp-p
PAL : L
SECAM : H
FROM IC002 ⑤
FL002 (1/3)
4.43MHz BPF
Q022
Q023
Q024
EQ
Q025
+5V
Q026
Q027
0.2Vp-p
DL001
2H COMB FILTER
PAL COLOR
ME SECAM COLOR
IC002 LA7332
REC
PB
ACC
ACC DET
(NTSC)
BURST EMPHASIS
MAIN CONVERTER
CONVERSION CARRIER (5.06MHz)
TO 4.43MHz BPF
PAL / ME SECAM
REC / PB
REC / PB DET
PAL
SECAM
BUST DEEMPHASIS
COLOR KILLER
KILLER
PB CHROMA TO IC001 ⑲
Q002
D006
D009
Q017
CN001
CN002
PB
JOG
LP
Voltage is 4 Vdc so chroma signal is not output.
0.6V
(NORMAL PB MODE)

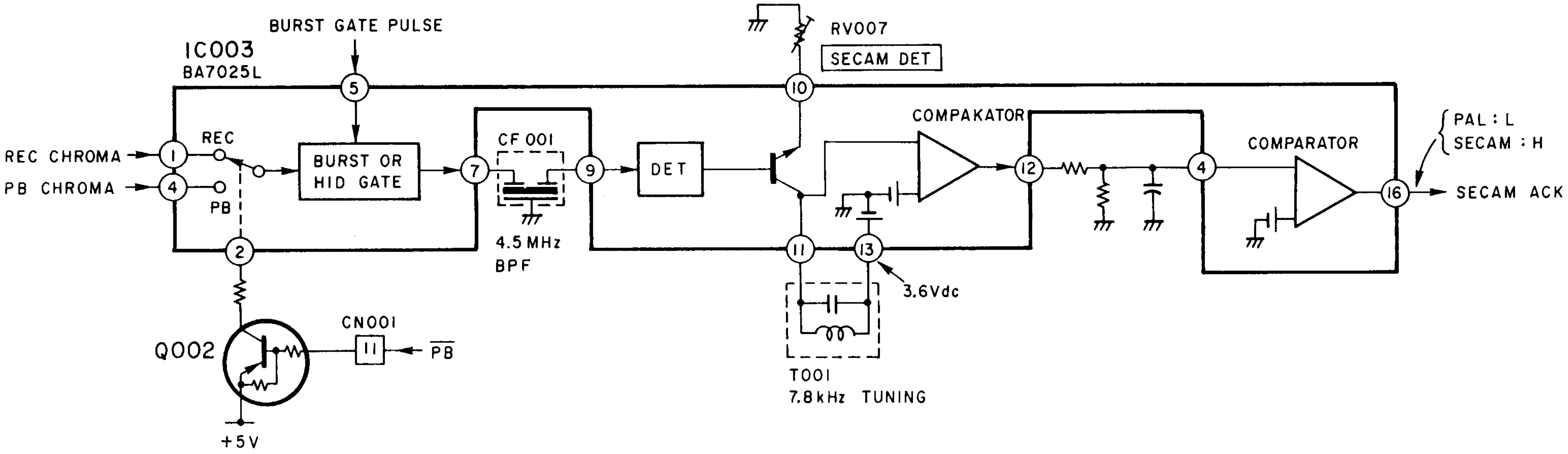
Fig. 3-20

Playback chroma signal (627 kHz) is inputted to the YC board CN002 pin ⑩ . The cutoff frequency is changed by LPF in PAL and ME SECAM. The chroma signal inputted to IC002 pin ⑦ passes through ACC AMP and is converted into the original frequency by the main converter. On the PAL chroma signal, the crosstalk signal from the adjacent track is removed by the 2H comb filter and is inputted to pin ㉔.

On the other hand, the ME SECAM chroma signal is inputted directly to pin ③ , then it is output to pin ㉓ through the color killer circuit.
In the LP JOG mode, Q017 turns ON when the pin ㉓ becomes 4 Vdc, thereby stopping the chroma signal output.
IC002 operates in PB mode when the pin ⑨ is set to "H".

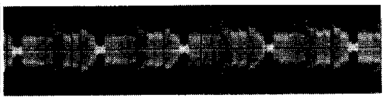
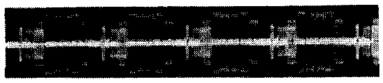
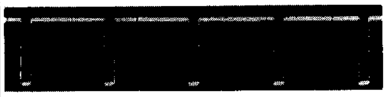
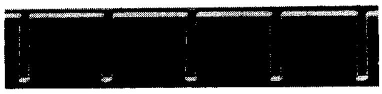
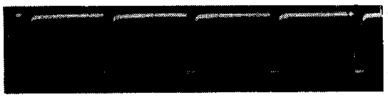
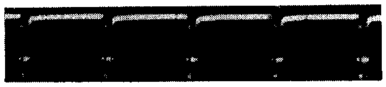
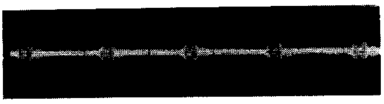
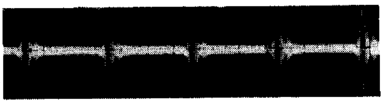
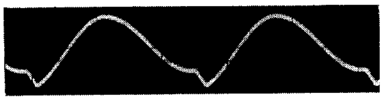
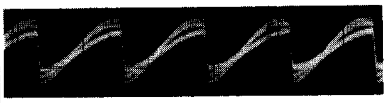
3-4-3. PAL/SECAM Signal Detection

The PAL burst signal contains 4.25 MHz (f_B) and 4.4025 MHz (f_R) which are sent alternately at 1H intervals. The difference between these two signals is detected to check for each signal.


BURST GATE PULSE
IC003
BA7025L
REC CHROMA
PB CHROMA
REC
PB
1
4
5
2
BURST OR
HID GATE
7
CF 001
4.5 MHz
BPF
9
DET
RV007
SECAM DET
10
COMPAKATOR
12
11
13
3.6Vdc
T001
7.8kHz TUNING
COMPARATOR
4
16
PAL : L
SECAM : H
SECAM ACK
Q002
CN001
11
PB
+5V

The chroma signal inputted to pin ① (REC input) or pin ④ (PB input) is picked up, as burst signal (PAL) or HID signal (SECAM), by the burst pulse inputted to pin ⑤ .The signal thus picked up passes through the 4.5 MHz BPF and is detected. In the case of the SECAM signal, the output signal shown in Fig. 3-21 is obtained from the tuning circuit (1/2 fH = 7.8 kHz) connected to pin ⑪ . This output signal is compared with the reference voltage by the comparator and "H" is output from pin ⑯ when SECAM signal is inputted.

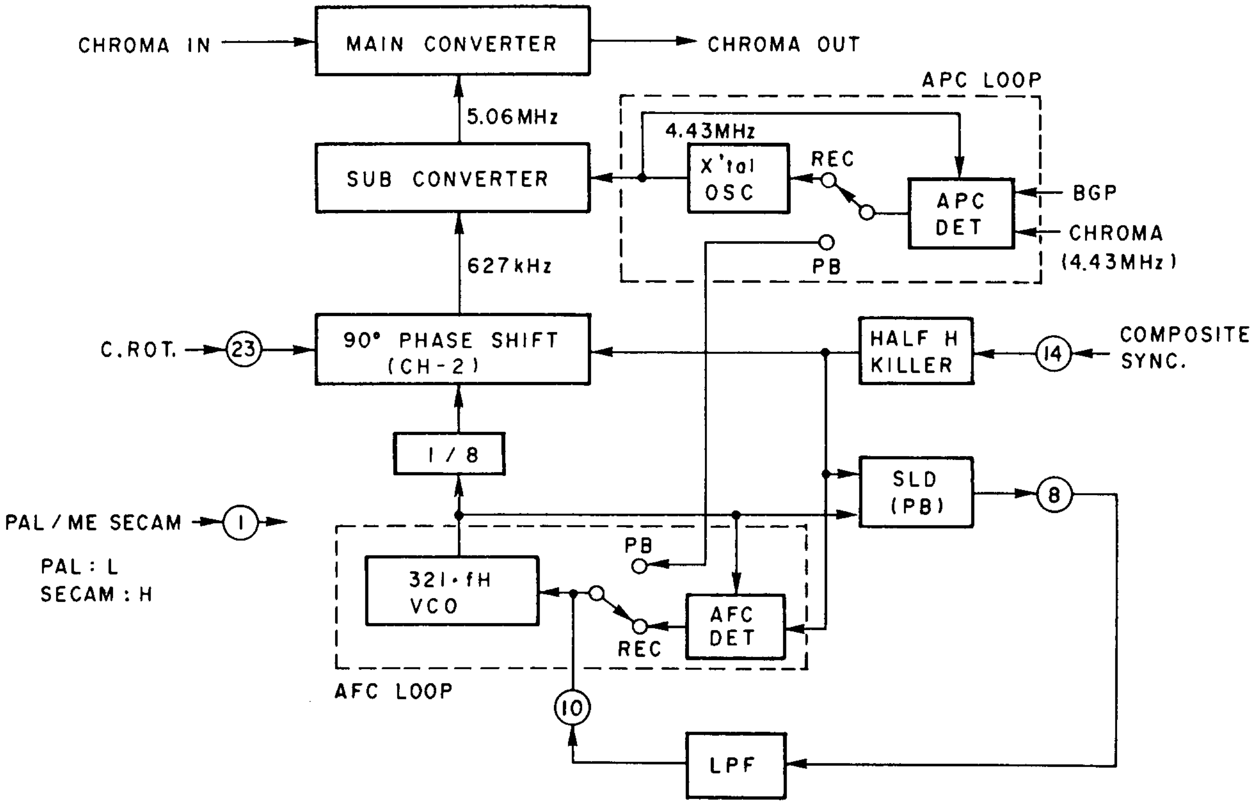
Fig. 3-21

SIGNAL / Pin No.	SECAM	PAL
1 REC 4 PB	 REC 0.4V PB 1V	 REC 0.5V PB 1.5V
5	 5V	 5V
7	 2V	 2V
9	 0.4V	 0.25V
11	 5V	 0.5V
12	4.2 Vdc	0 Vdc
14	4.2 Vdc	0 Vdc
16	H (4.4 Vdc)	L (0.3 Vdc)

3-4-4. Frequency Converter Circuit

The chroma process IC (LA7332) can be used for 3 systems PAL/ME SECAM/NTSC by changing the voltage on pin ①.
(This unit uses only 2 systems PAL/ME SECAM.)

1. PAL mode



CHROMA IN
MAIN CONVERTER
CHROMA OUT
APC LOOP
5.06MHz
4.43MHz
SUB CONVERTER
X'tal OSC
REC
APC DET
BGP
CHROMA (4.43MHz)
627kHz
PB
C.ROT.
23
90° PHASE SHIFT (CH-2)
HALF H KILLER
14
COMPOSITE SYNC.
1/8
SLD (PB)
8
PAL/ME SECAM
1
PAL : L
SECAM : H
PB
321·fH VCO
AFC DET
REC
AFC LOOP
10
LPF

Fig. 3-22

PAL MODE		
VCO FREQUENCY	REC/PB	321 . fH
VCO CONTROL	REC	AFC
	PB	APC
X'tal CONTROL	REC	APC
	PB	FREERUN
90° PHASE SHIFT	1CH (C. ROT: L)	STOP
	2CH (C. ROT: H)	Phase shift of 90° at each 1H

[Main converter]

REC: Chroma signal is changed from 4.43 MHz to 627 kHz (40 f_H + 1/8 f_H).

PB: Chroma signal is changed from 627 kHz (40 f_H) + 1/8 f_H) to 4.43 MHz.

[Sub-converter]

REC/PB: The conversion carrier signal of 5.06 MHz is obtained by the 4.43 MHz signal from the APC circuit and the output, frequency divided into 1/2, from the AFC circuit.

[APC ... Automatic phase control]

REC: The burst signal of 4.43 MHz chroma signal is compared with the signal from the X'tal oscillator to obtain phase locked 4.43 MHz signal on the burst signal by feeding back the phase error to the X'tal oscillator.

(During recording, it operates as VCXO...Voltage controlled crystal oscillator.)

PB: This operates as a fixed X'tal oscillator to obtain 4.43 MHz signal.

(During playback, it operates as XO...X>tal oscillator.)

APC error is inputted to 321 f_H VCO during playback.

[AFC ... Automatic frequency control]

REC: The H. SYNC signal separated from the input composite video signal is compared with 321 f_H VCO and its phase error is fed back to 321 f_H VCO to obtain a phase locked signal of about 5 MHz on the H. SYNC signal.

PB: During playback, a signal of about 5 MHz controlled by APC error and SLD error, not by AFC error, is obtained. The jitter contained in playback video signal is removed by the jitter component contained in APC error.

[90° phase shift]

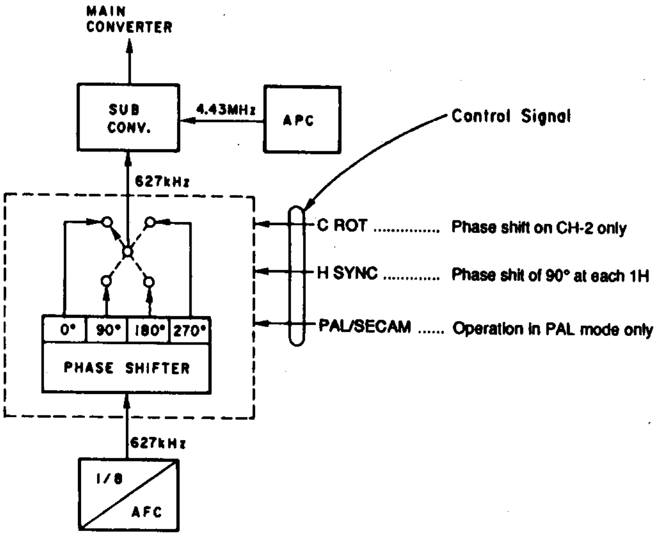

MAIN CONVERTER
SUB CONV.
4.43MHz
APC
627kHz
Control Signal
C ROT .... Phase shift on CH-2 only
H SYNC .... Phase shit of 90° at each 1H
PAL/SECAM ...... Operation in PAL mode only
0°
90°
180°
270°
PHASE SHIFTER
627kHz
1/8
AFC

Fig. 3-23

REC: Phase is lagged by 90° at each 1H on CH-2
(C ROT: H).

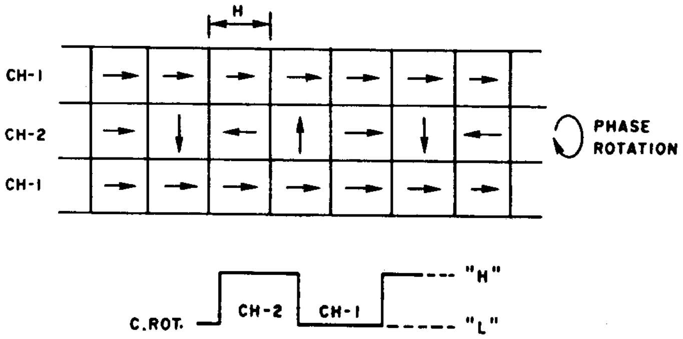

H
CH-1
CH-2
CH-1
PHASE ROTATION
C.ROT.
CH-2
CH-1
"H"
"L"

Fig. 3-24

C ROT.... Color rotation signal
Phase shift circuit is controlled by the signal
synchronized with RF SW pulse.

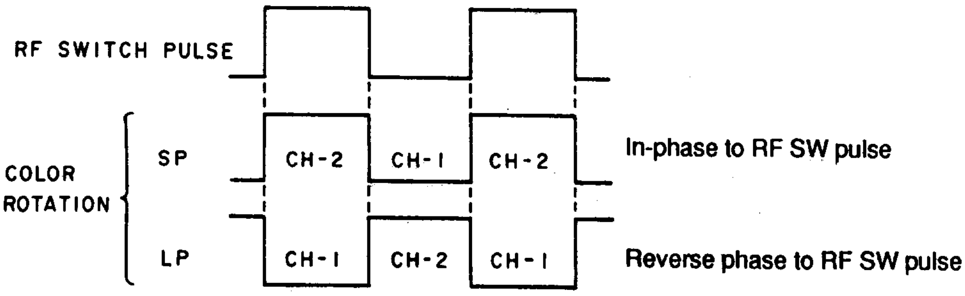

RF SWITCH PULSE
COLOR ROTATION
SP
CH-2
CH-1
CH-2
In-phase to RF SW pulse
LP
CH-1
CH-2
CH-1
Reverse phase to RF SW pulse

Fig. 3-25

PB: Phase is advanced by ° at each 1H and returns to the original phase on CH-2 (C ROT: H).

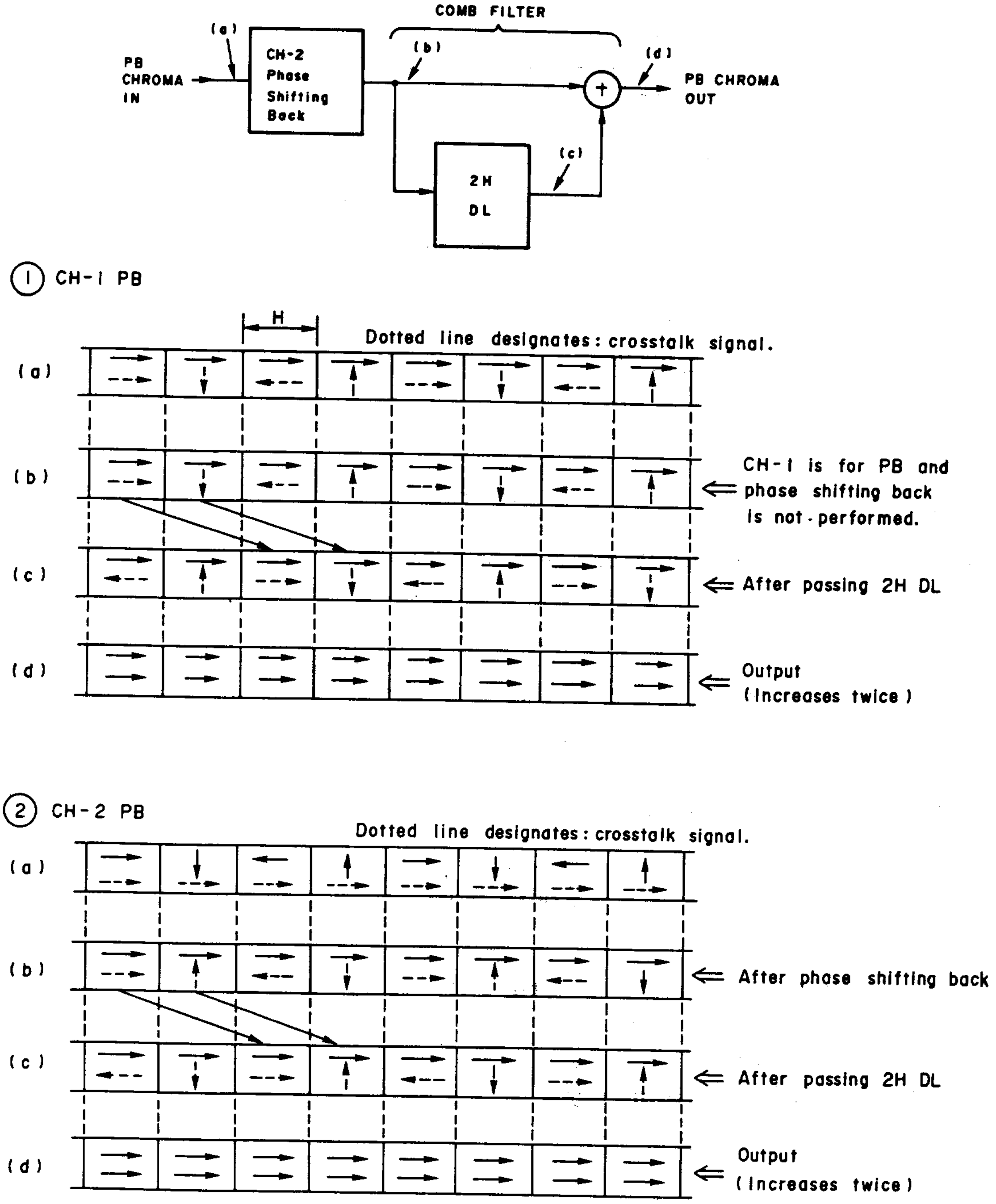

COMB FILTER
(a)
(b)
(c)
(d)
PB CHROMA IN
CH-2 Phase Shifting Back
2H DL
PB CHROMA OUT
① CH-1 PB
H
Dotted line designates: crosstalk signal.
(a)
(b)
(c)
(d)
CH-1 is for PB and phase shifting back is not-performed.
After passing 2H DL
Output (Increases twice)
② CH-2 PB
Dotted line designates: crosstalk signal.
(a)
(b)
(c)
(d)
After phase shifting back
After passing 2H DL
Output (Increases twice)

Fig. 3-26

- During CH-1 playback

The phase of the signal (a) replayed is not phase shifted backward because CH-1 is replayed. Therefore, the signal (b) is the same as the signal (a). By passing the signal (b) through the comb line filter, the crosstalk signals are cancelled as they are mutually anti-phase, and a signal (d) with the crosstalk signal removed is obtained.

- During CH-2 playback

The phase of the replayed signal (a) is phase shifted backward, and the signal becomes a signal (b). By passing the signal (b) through the comb line filter, the crosstalk signals are cancelled as they are mutually anti-phase, and a signal (d) with the crosstalk signal removed is obtained.

[SLD...Side lock detector] ... Operates during playback.

This circuit operates during playback to prevent color distortion caused by mislocking of the APC circuit.

In the playback mode, the APC circuit detects the output signal of the X'tal oscillator and the burst signal of the playback chroma signal (4.43 MHz), and its phase error is fed back to VCO. At this time, the APC loop may be stabilized even when the VCO oscillating frequency is deviated from the given frequency (mislocking).

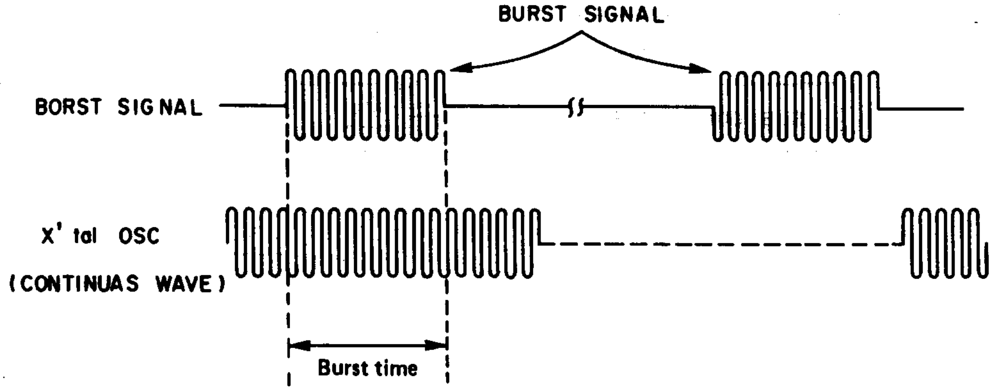


Fig. 3-27

It should be noted that the phase detector operates only for the burst time on the 2 input signals shown in Fig. 3-27. When the burst signal is a continuous wave signal, there is a difference of ± n cycles (n=integer) between the burst signal and the next burst signal. Therefore, the PLL is locked during operation for the burst time even when the burst signal frequency is deviated by n-fold of f_H.

Accordingly, when the VCO oscillating frequency is deviated by 8 x n-fold of Hm the PLL is locked (side lock), so the playback color signal is distorted.

The side lock detector checks the VCO frequency for 4H time (64 µsec x 4=256 usec) and outputs a compensation pulse when the frequency exceeds the given range, thus preventing a side lock.

2. ME SECAM mode

Unlike the PAL mode, the ME SECAM mode performs the same operation in REC/PB mode when 90° phase sht circuit is not operating.

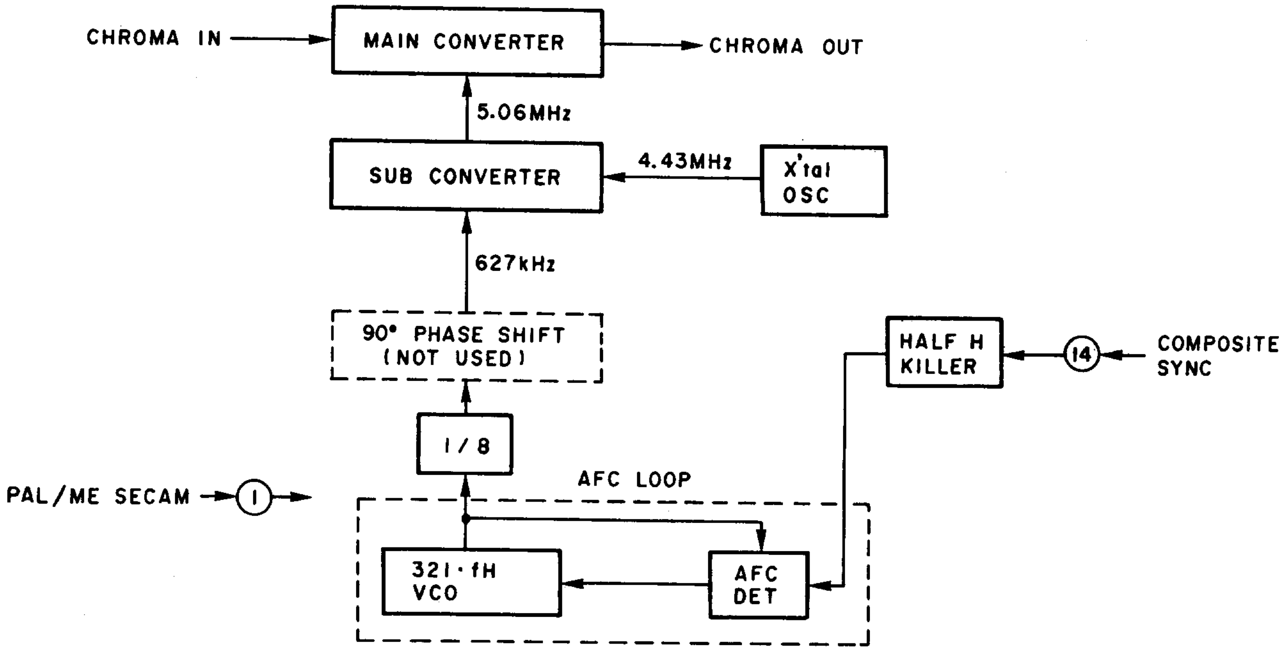

CHROMA IN
MAIN CONVERTER
CHROMA OUT
5.06MHz
SUB CONVERTER
4.43MHz
X'tal OSC
627kHz
90° PHASE SHIFT (NOT USED)
HALF H KILLER
14
COMPOSITE SYNC
1/8
AFC LOOP
PAL/ME SECAM
1
321·fH VCO
AFC DET

Fig. 3-28

ME SECAM MODE		
VCO FREQUENCY	REC/PB	321 . fH
VCO CONTROL	REC/PB	AFC
X'tal CONTROL	REC/PB	FREERUN
90° PHASE SHIFT	REC/PB	NOT USED

[Functions of IC002 LA7332]

Pin No.	Name	I/O	Function
1	S/P/N	I	System select input. L: PAL, M: NTSC, H: SECAM
2	ACC	O	ACC filter
3	REC CHROMA	I	REC chroma signal input
4	BYPASS	O	FILTER
5	C OUT	O	REC/PB chroma signal output
6	GND	–	
7	PB C IN	I	PB chroma signal input
8	SLD OUT	O	Side lock detector output
9	REC C OUT	I/O	REC chroma signal output and REC/PB select input (Note 1)
10	FILTER	O	321 fH VCO filter
11	5.06 M IN	I	Main converter carrier (5.06 MHz) input
12	KIL	O	Killer filter
13	5.06M OUT	O	Main converter carrier (5.06 MHz) output
14	SYNC IN BGP OUT	I/O	Composite sync input and BGP output. (Note 2)
15	APC FIL	I/O	REC APC filter and JOG control. (Note 3)
16	VCO TANK	O	321 fH VCO TUNING
17	2F$_{sc}$ OUT	O	2 f$_{sc}$ output (for 1H CCD delay)
18	XO OUT	O	X'tal OSC output
19	XO IN	I	X'tal OSC input
20	VCC	I	+5 V
21	V IN	I	REC video signal input
22	SW 25	I	RF SW [i;se om[it amd SP/LP select input. (Note 4)
23	PB C OUT	O	PB chroma signal output
24	PB C IN	I	PB (PAL) chroma signal input

Note 1: REC/PB mode control

The pin ⑨ is used for REC chroma signal output and REC/PB select input.

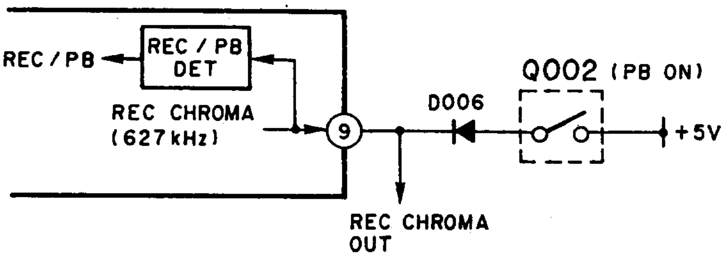

REC / PB
REC / PB DET
REC CHROMA (627 kHz)
9
D006
Q002 (PB ON)
+5V
REC CHROMA OUT

Fig. 3-29

By applying a voltage of more than 2.1 Vdc to pin ⑨, it operates in PB mode.

Note 2:

The pin ⑭ is used for composite sync signal input and burst gate pulse signal output.

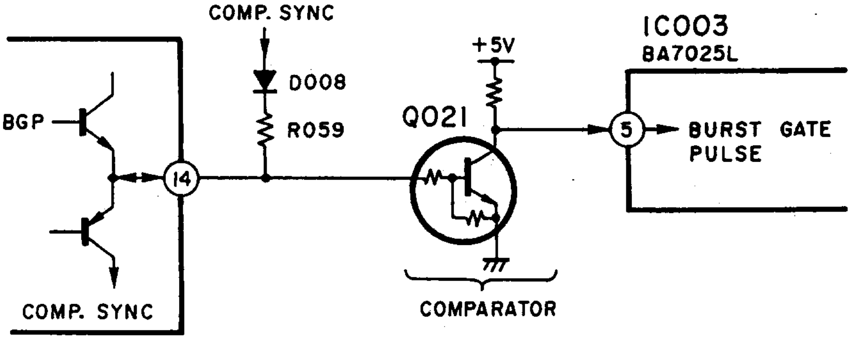

COMP. SYNC
+5V
IC003
BA7025L
D008
BGP
R059
Q021
5
BURST GATE PULSE
14
COMP. SYNC
COMPARATOR

Fig. 3-30

The voltage on pin ⑭ is 1.2V at composite sync signal input and 4.2V at burst gate pulse signal output.

By connecting an external comparator (Q021), the burst gate pulse signal can be picked up.

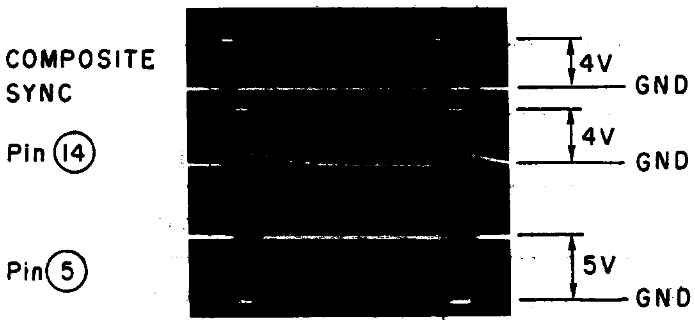


Fig. 3-31

Note 3: JOG control
The pin ⑮ functions as APC filter in REC mode. It also functions as a control terminal for variable speed playback (JOG mode) in PB mode.

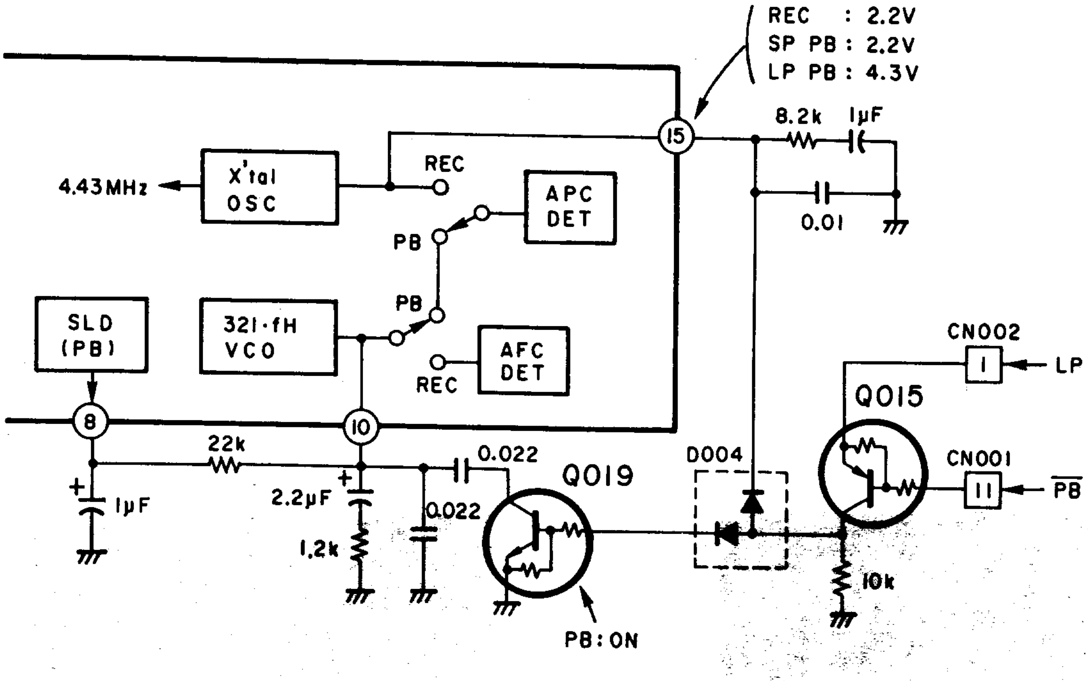

REC : 2.2V
SP PB : 2.2V
LP PB : 4.3V
15
8.2k
1µF
0.01
4.43MHz
X'tal OSC
REC
PB
APC DET
PB
SLD (PB)
321·fH VCO
AFC DET
REC
8
10
22k
1µF
2.2µF
1.2k
0.022
0.022
Q019
PB:ON
D004
CN002
1
LP
Q015
CN001
11
PB
10k

Fig. 3-32

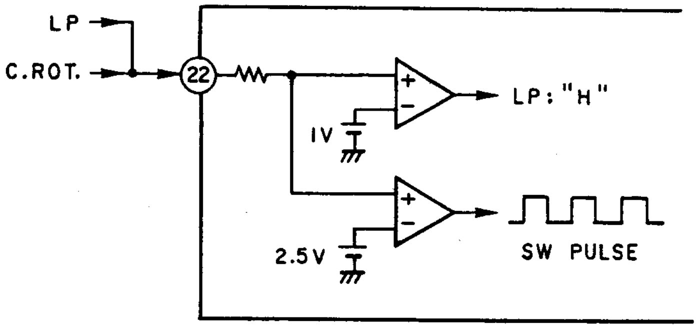
The time constant of the APC filter at pin ⑩ is extended while the voltage on pin ⑮ is set to "H" to prevent the color from being lost even when the color arrangement (color layout) is discontinued during LP playback mode.

In this unit, the pin ㉓ (PB chroma output terminal) is forcedly set to "H" in LP JOG.
G mode to obtain black/white picture.

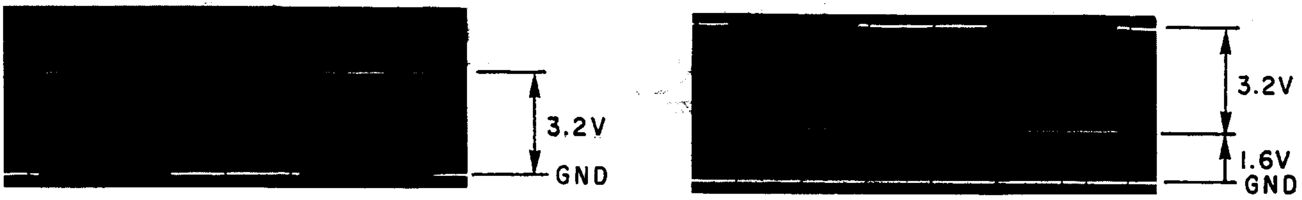
Note 4: SP/LP mode control

The pin ㉒ is used for SW pulse input and SP/LP mode selection.

The IC inside incorporates 2 comparators to detect 2 conditions (SP/LP).



Pin ㉒ waveform

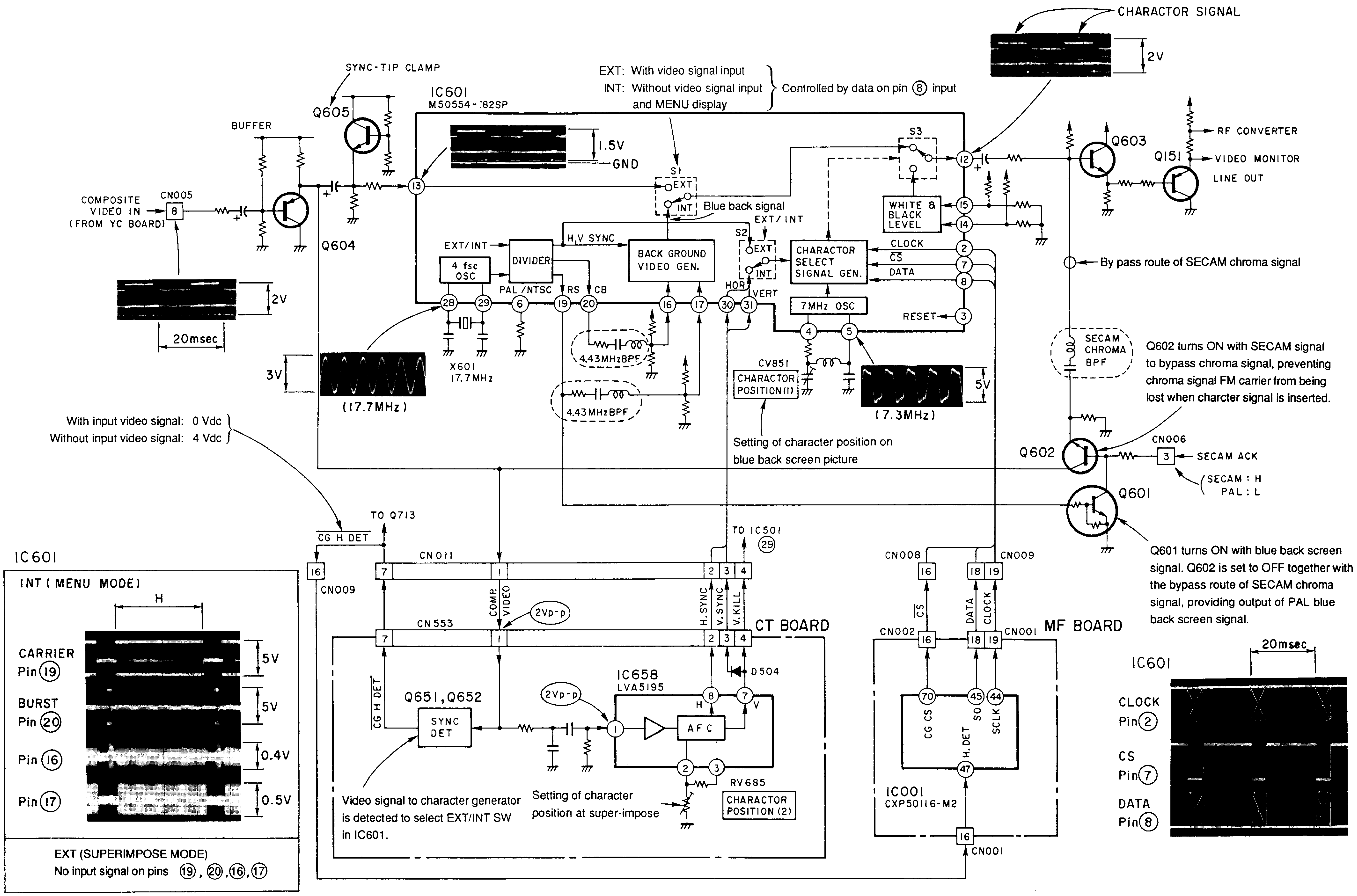


SP MODE LP MODE

Fig. 3-33

When the voltage on pin ㉒ is more than 2.5V, it detects SWpulse. When the lowest level of input pulse is more than 1.3V, it detects LP mode, and when it is 0.7V, SP mode is detected.

3-5. CHARACTER GENERATOR


EXT: With video signal input
INT: Without video signal input and MENU display
Controlled by data on pin ⑧ input

With input video signal: 0 Vdc
Without input video signal: 4 Vdc

Blue back signal

Setting of character position on blue back screen picture

Q602 turns ON with SECAM signal to bypass chroma signal, preventing chroma signal FM carrier from being lost when charcter signal is inserted.

By pass route of SECAM chroma signal

Q601 turns ON with blue back screen signal. Q602 is set to OFF together with the bypass route of SECAM chroma signal, providing output of PAL blue back screen signal.

Video signal to character generator is detected to select EXT/INT SW in IC601.

Setting of character position at super-impose

EXT (SUPERIMPOSE MODE)
No input signal on pins ⑲, ⑳, ⑯, ⑰

SYNC-TIP CLAMP
IC601
M50554-182SP
Q605
BUFFER
COMPOSITE VIDEO IN (FROM YC BOARD)
CN005
8
Q604
2V
20msec
1.5V
GND
S1
EXT
INT
EXT/INT
H,V SYNC
BACK GROUND VIDEO GEN.
S2
DIVIDER
4 fsc OSC
PAL/NTSC
RS
CB
HOR
VERT
CHARACTOR SELECT SIGNAL GEN.
7MHz OSC
CLOCK
CS
DATA
RESET
WHITE & BLACK LEVEL
S3
CHARACTOR SIGNAL
2V
Q603
Q151
RF CONVERTER
VIDEO MONITOR
LINE OUT
3V
(17.7MHz)
X601
17.7MHz
4.43MHzBPF
4.43MHzBPF
CV851
CHARACTOR POSITION(1)
5V
(7.3MHz)
SECAM CHROMA BPF
CN006
SECAM ACK
SECAM : H
PAL : L
Q602
Q601
TO Q713
CG H DET
CN009
CN011
COMP. VIDEO
2Vp-p
H.SYNC
V.SYNC
V.KILL
TO IC501 ㉙
CN553
CT BOARD
CG H DET
Q651,Q652
SYNC DET
2Vp-p
IC658
LVA5195
AFC
D504
RV685
CHARACTOR POSITION (2)
CN008
CN009
CS
DATA
CLOCK
CN002
CN001
MF BOARD
CG CS
SO
SCLK
H. DET
IC001
CXP50116-M2
CN001
IC601
INT (MENU MODE)
H
CARRIER Pin ⑲
BURST Pin ⑳
Pin ⑯
Pin ⑰
5V
5V
0.4V
0.5V
IC601
20msec
CLOCK Pin ②
CS Pin ⑦
DATA Pin ⑧

Fig. 3-34

The character generator has the following 4 functions.

1) Data of VTR operation mode, tape counter, remaining tape length, TV channel, tracking, tape speed, etc., are super-imposed on the monitor screen.
2) Timer ON screen picture for checking timer video recording is generated.
3) Menu picture for preset data are generated.
4) Blue back picture is generated at no-signal put or no signal playback.

The character generator (IC601 generates character signals using control signals 9DATA, CLOCK, CS) from DISPLAY/system control µP (IC001), which is added to the input video signal that is inputted to IC601 pin ⑬ and is output to pin ⑫ through the switches S1 and S3 in the IC.The 4 fsc oscillator circuit generates 17.72 MHz, the output of which is divided into 4.43 MHz, 15.625 MHz and 60 Hz by the frequency divider. The frequency divider outputs a blue picture carrier from pin ⑲ and a burst carrier from pin ⑳.The background signal generator produces blue back signal from these signals, which is supplied to S1.

The character select signal generator produces character select signal by CLOCK/CS/DATA signal, clock signal from 7 MHz OSC circuit and H/V sync signal from S2.

Character select signal is composed of a series of pulses, which is added to the input video signal by using S3.

When DC level (approx. 2.3V) on pin ⑮ is selected by S3 at the presence of character select signal, a white dot is displayed. When DC level (approx. 0.9V) on pin ⑭ is selected, an edge (frame) signal is displayed.

[Communication between character generator and microprocessor]

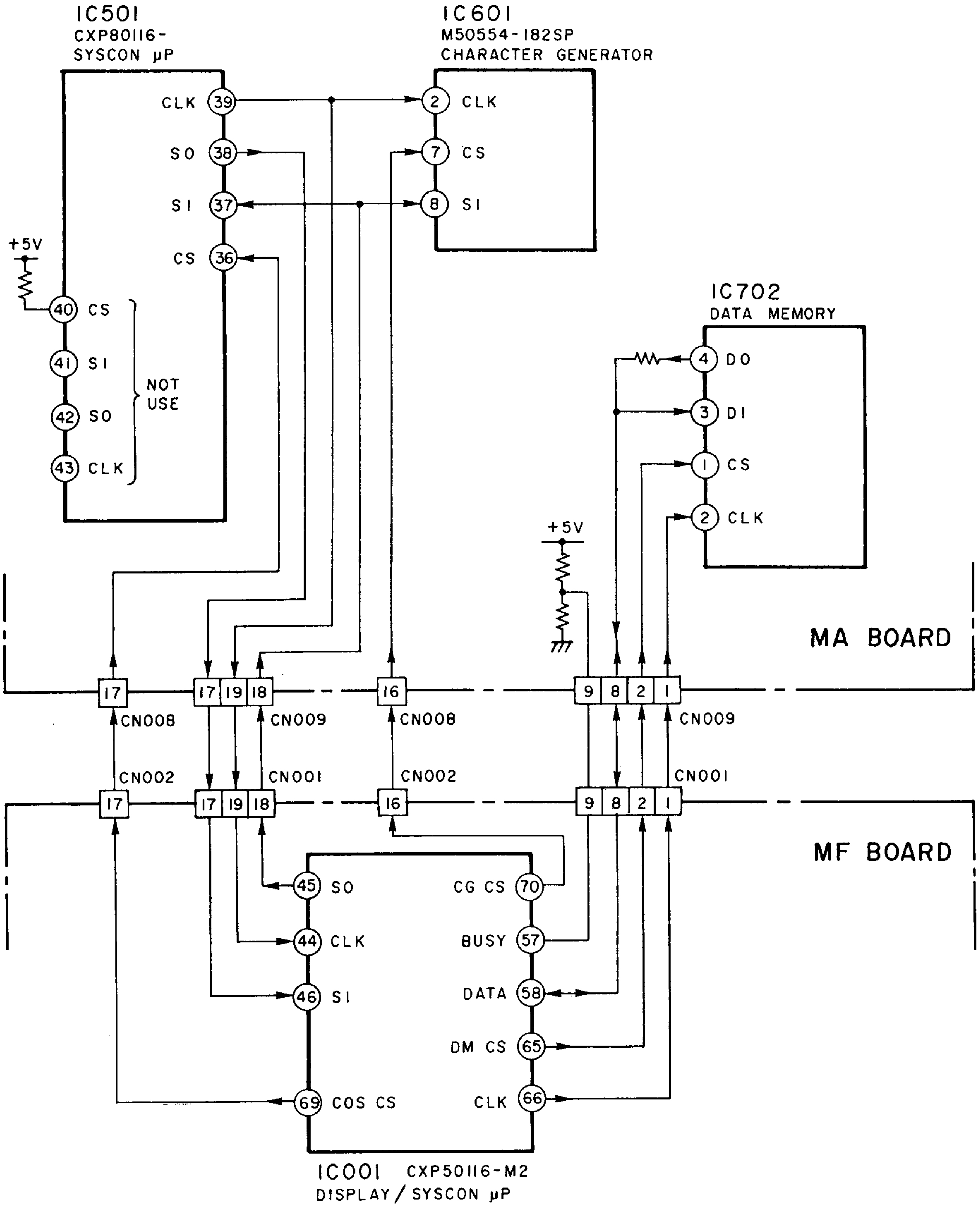

IC501
CXP80116-
SYSCON µP
CLK 39
SO 38
SI 37
CS 36
+5V
40 CS
41 SI
42 SO
43 CLK
NOT USE
IC601
M50554-182SP
CHARACTER GENERATOR
2 CLK
7 CS
8 SI
IC702
DATA MEMORY
4 DO
3 DI
1 CS
2 CLK
+5V
MA BOARD
17
17 19 18
16
9 8 2 1
CN008
CN009
CN008
CN009
CN002
CN001
CN002
CN001
17
17 19 18
16
9 8 2 1
MF BOARD
45 SO
44 CLK
46 SI
69 COS CS
CG CS 70
BUSY 57
DATA 58
DM CS 65
CLK 66
IC001 CXP50116-M2
DISPLAY/SYSCON µP

Fig. 3-35

[IC601 M50554-182 SP]

Pin No.	Name	I/O	Function
1	Vssl	–	GND (digital circuit)
2	CLK	I	Serial clock. Serial data is picked up at the rise of CLK when CS is "L".
3	$\overline{\text{AC}}$	I	IC internal circuit is reset at "L".
4	OSC1	I	External pin of oscillator circuit. With the standard oscillating frequency of 7 MHz, horizontal display position and character width on TV picture are determined.
5	OSC2	O	
6	NT/PAL	I	H: NTSC, L: PAL
7	$\overline{\text{CS}}$	I	Chip select. "L" at transfer of serial data.
8	SI	I	Serial data
9	PA OUT	O	Parity output for detecting serial data error. Note: Not used
10	SY EX	I	Sync signal select signal. H: External sync, L: Internal sync
11	Vss2	–	GND (analog circuit)
12	V OUT	O	Composite video signal output
13	V IN	I	Composite videosignal input
14	LEBK	I	Setting of video signal blanking level.
15	LECHA	I	Setting of video signal character output level.
16	CB IN	I	Color burst signal. CB output is converted into video signal color burst level by external circuit.
17	RS IN	I	RS output is converted into video signal carrier color level by external circuit.
18	VDD2	I	+5 V (analog circuit)
19	RS	O	Carrier color signal output for coloring character background.
20	CB	O	Color burst signal, 4.43 MHz.
21	YM	O	Luminance signal. Note) Not used

Pin No.	Name	I/O	Function
22	BLNK	O	Character background signal. Note: Not used
23	CO	O	Character signal. Note: Not used
24	B	O	Blue, green and red signals. Note: Not used
25	G		
26	R		
27	CSYN	O	Composite sync signal. Note: Not used
28	OSC O	O	External pin of sync signal oscillator circuit.
29	OSC I	I	
30	HOR	I	Horizontal sync signal.
31	VERT	I	Vertical sync signal.
32	VDD1	I	+5 V (digital circuit)

SECTION 4. SERVO CIRCUIT

General

Drum Speed Servo

The drum is rotated at 1500 rpm. The drum speed is controlled by FG signal.

Drum phase servo

The phase of drum rotation is synchronized with the reference signal (25 Hz). The reference signal is synchronized with the sync signal separated from the input video signal during recording. The phase of drum rotation is controlled by PG signal.

Capstan Speed Servo

Tape runs at the following speed.

SP mode... 23.39 mm/sec
LP mode... 11.7 mm/sec

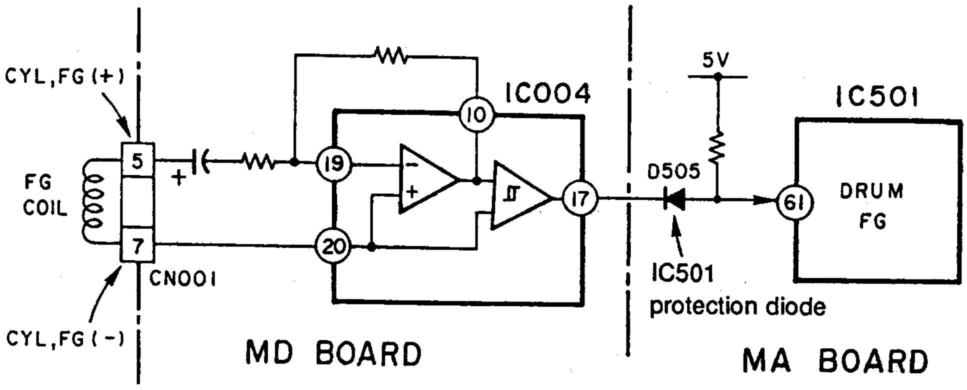
Tape speed is controlled by FG signal.

Capstan Phase servo

Capstan motor is controlled by CTL signal so that the video head can trace the video track recorded on tape.

4-1. DRUM SERVO

4-1-1. DRUM FG amplifier



CYL,FG(+)
FG COIL
5
7
CN001
CYL,FG(-)
IC004
10
19
20
17
MD BOARD
5V
D505
IC501
protection diode
61
IC501
DRUM FG
MA BOARD

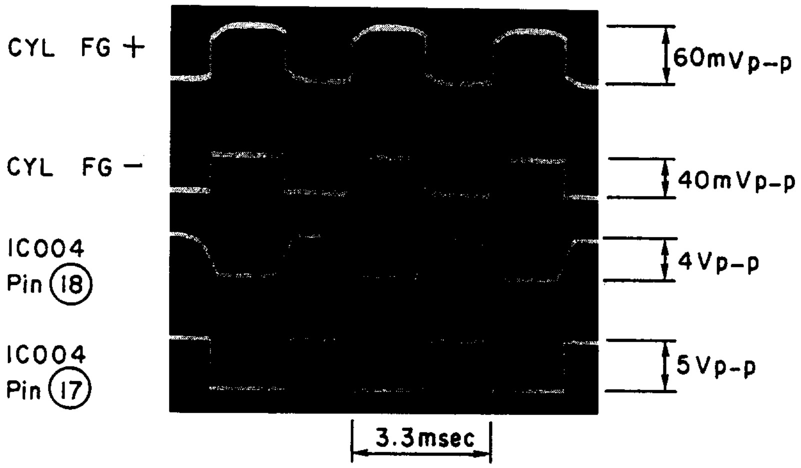
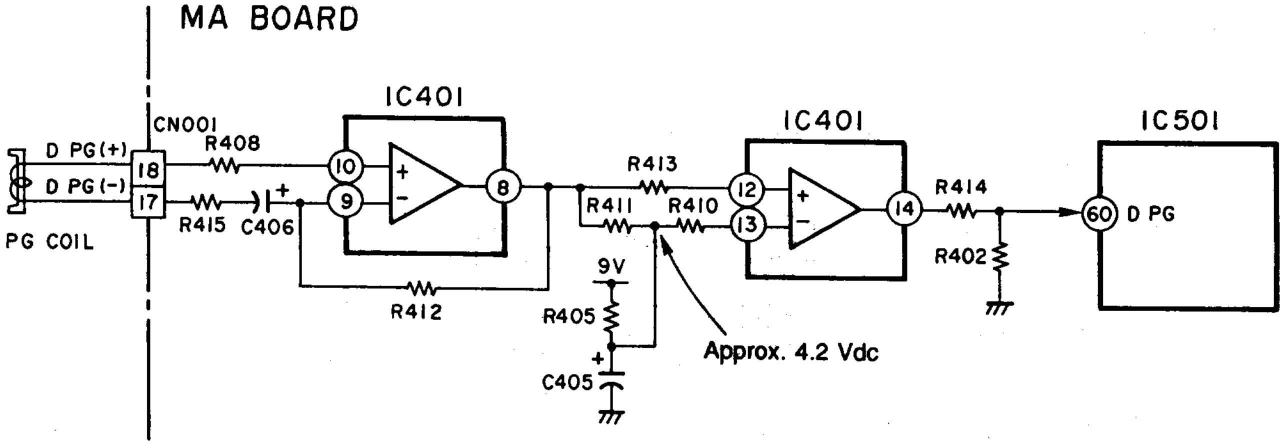


Fig. 4-1

DFG signal (12 waves/rotation=300 Hz) generated from the drum FG coil is amplified by IC004 and is inputted to the system control microprocessor (IC501) after the waveform is shaped.

The DFG signal is also used for drum rotation detection.

4-1-2. Drum PG Amplifier


MA BOARD
IC401
IC401
IC501
CN001
D PG(+)
D PG(-)
R408
18
17
R415
C406
PG COIL
10
9
8
R412
R413
R411
R410
9V
R405
C405
12
13
14
Approx. 4.2 Vdc
R414
R402
60
D PG

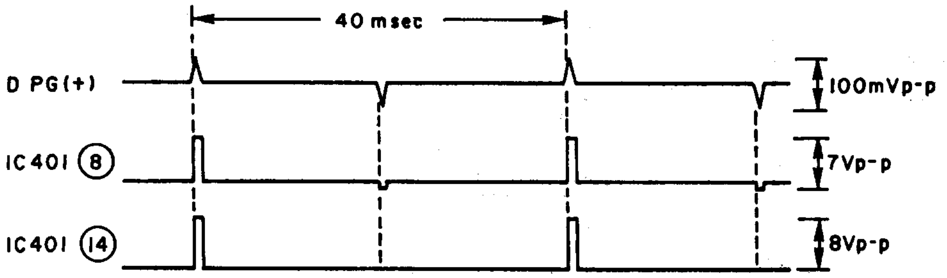


Fig. 4-2

Of the positive/negative pulse generated from the PG coil (TACH sensor), the positive pulse is amplified by IC401 and its waveform is shaped for 8Vp-p pulse.

This pulse is divided by R414 and 402 to obtain 5Vp-p pulse which is inputted to the system control microprocessor (IC501).

4-1-3. Drum Servo Process

[Drum servo block diagram]

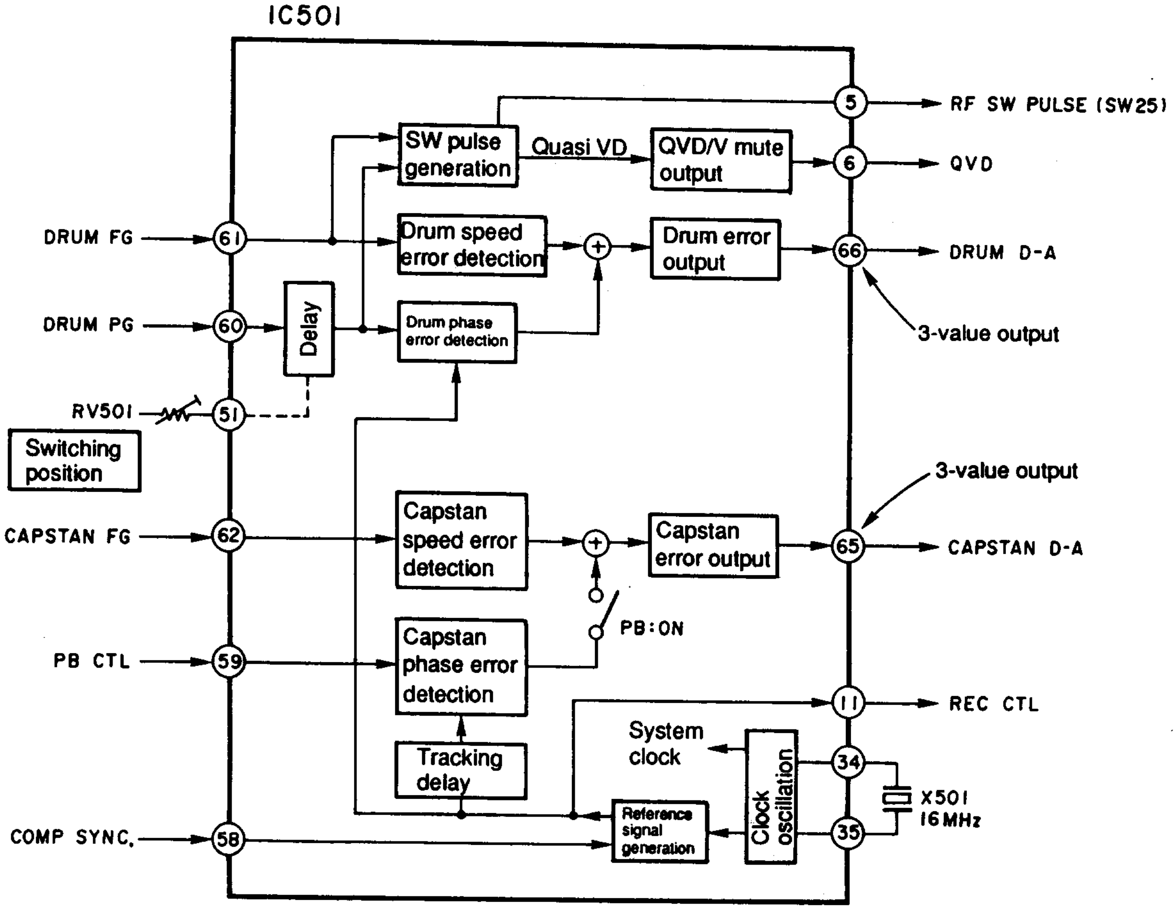

IC501
SW pulse generation
Quasi VD
QVD/V mute output
5
RF SW PULSE (SW25)
6
QVD
DRUM FG
61
Drum speed error detection
Drum error output
66
DRUM D-A
3-value output
DRUM PG
60
Delay
Drum phase error detection
RV501
51
Switching position
3-value output
CAPSTAN FG
62
Capstan speed error detection
Capstan error output
65
CAPSTAN D-A
PB:ON
PB CTL
59
Capstan phase error detection
11
REC CTL
System clock
Tracking delay
Clock oscillation
34
X501
16MHz
Reference signal generation
35
COMP SYNC.
58

Fig. 4-3

(1) Drum speed error detection

The cycle of drum FG signal is counted to detect the speed error which is a deviation from the reference value (3.33 msec).

(2) Drum phase error detection

Drum PG signal is delayed by approx. 3.8 msec to generate RF SW pulse which is compared with the reference signal to detect the phase difference (phase error). The reference signal is generated by dividing the frequency of the system clock. It is synchronized with COMP sync signal on pin (58) input at the time of recording or insert. It is not synchronized at the time of playback.

(3) f_H compensation

In the variable speed playback mode, the drum speed is controlled by changing the cycle of the reference signal for detecting speed error and phase error, thereby performing f_H compensation.

Mode	Drum speed compensation (%)	
	SP	LP
CUE	+3.0	+2.0
REVIEW	-4.0	-2.5
STILL	-0.5	-0.3

(4) Drum error output

Drum speed error and drum phase error are added in IC, and the drum error thus obtained is output from pin (66).

The drum speed error is output in 3 values of "H", "L" and "HIZ".

(5) RF SW pulse generation

This pulse is generated by dividing the frequency of drum FG signal with the drum PG signal triggered.

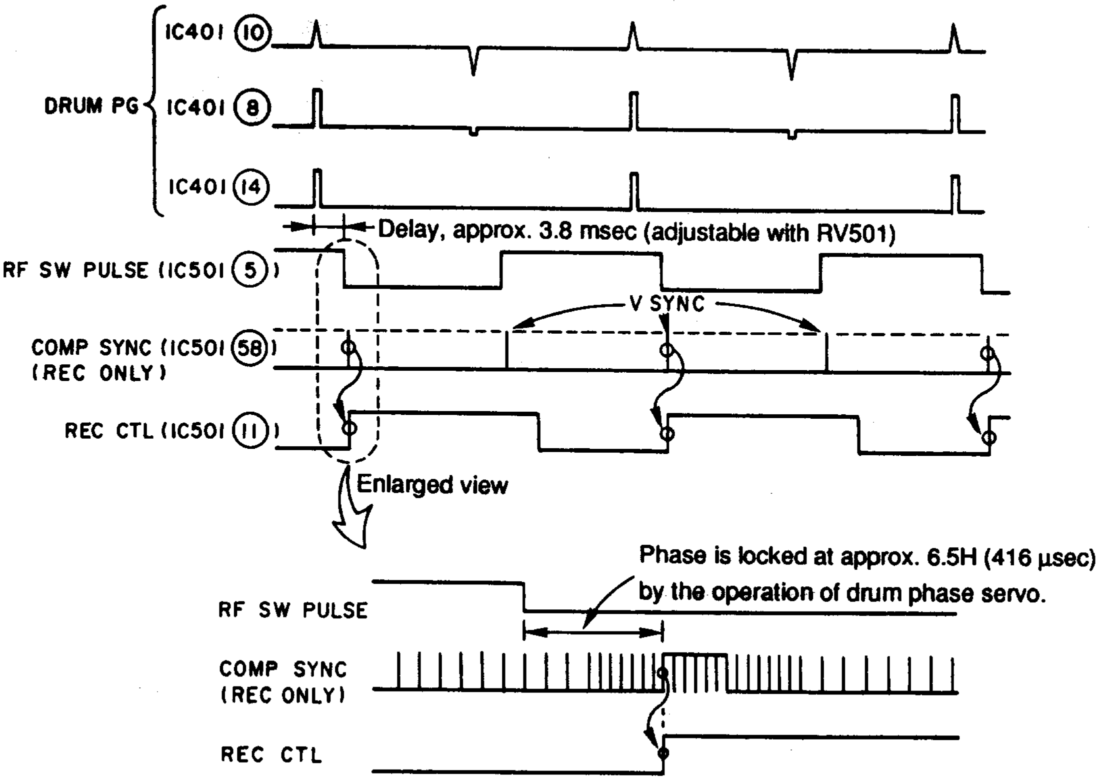

IC401 ⑩
DRUM PG
IC401 ⑧
IC401 ⑭
Delay, approx. 3.8 msec (adjustable with RV501)
RF SW PULSE (IC501 ⑤)
V SYNC
COMP SYNC (IC501 (58))
(REC ONLY)
REC CTL (IC501 ⑪)
Enlarged view
Phase is locked at approx. 6.5H (416 μsec)
by the operation of drum phase servo.
RF SW PULSE
COMP SYNC
(REC ONLY)
REC CTL

Fig. 4-4

4-1-4. Drum Motor Drive Circuit

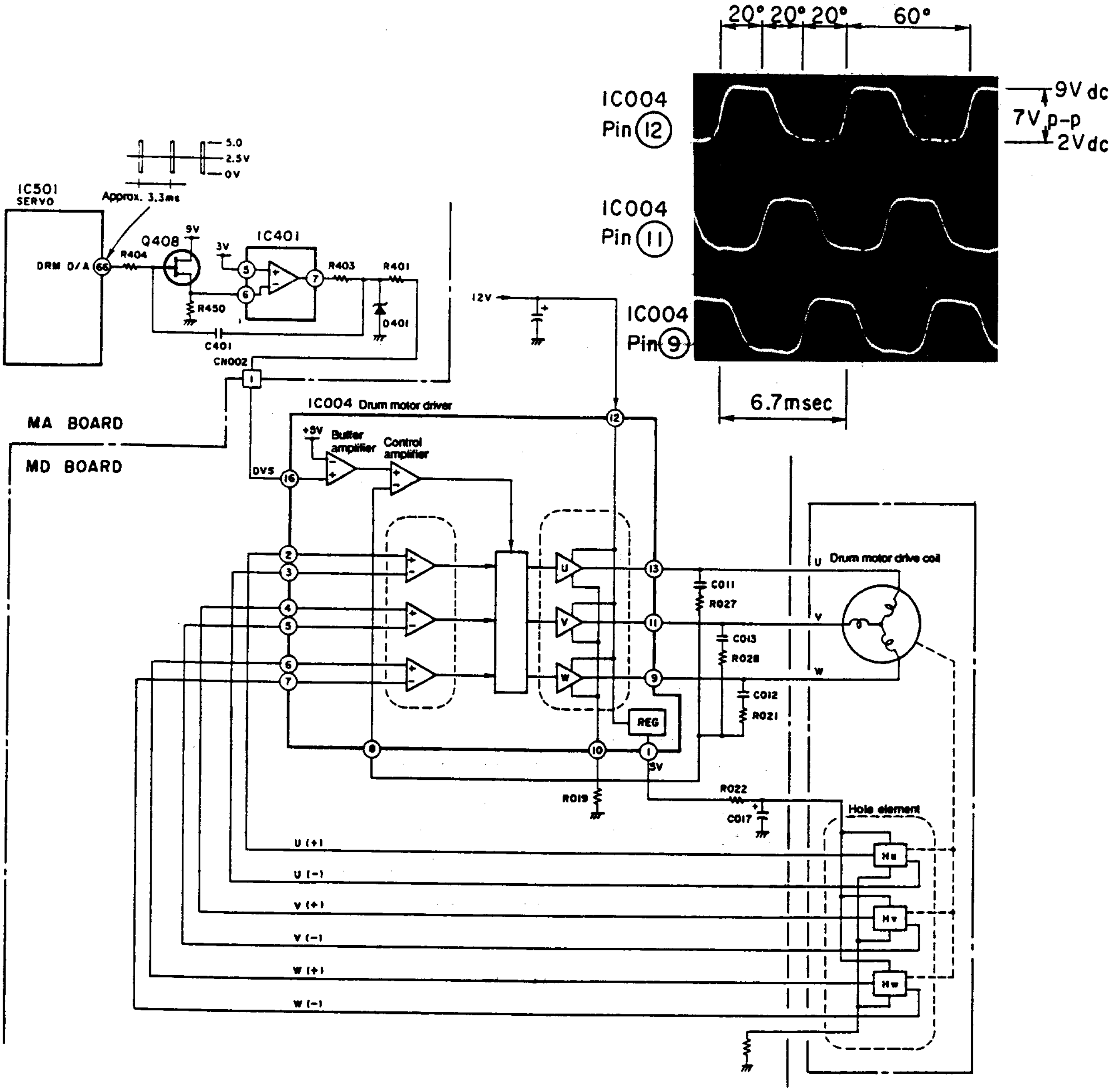

20° 20° 20° 60°
IC004 Pin ⑫
IC004 Pin ⑪
IC004 Pin ⑨
9V dc
7V p-p
2V dc
6.7msec
5.0
2.5V
0V
Approx. 3.3ms
IC501 SERVO
DRM O/A ⑥⑥
R404
Q408
9V
3V
IC401
R403
R401
R450
D401
C401
CN002
12V
MA BOARD
MD BOARD
IC004 Drum motor driver
+5V
Buffer amplifier
Control amplifier
DVS ⑯
U
V
W
REG
5V
C011
R027
C013
R028
C012
R021
R019
R022
C017
Drum motor drive coil
Hole element
Hu
Hv
Hw
U (+)
U (-)
V (+)
V (-)
W (+)
W (-)

Fig. 4-5

(1) Integrating circuit

Drum error is output in 3 values "H", "L" and "HIZ" of pulse signals (approx. 3.3 msec cycle) from IC501 pin (66) . This output is integrated by IC401 and Q408 to obtain drum servo error voltage on IC401 pin ⑦ .

(2) Drive circuit

Drum servo error voltage is inputted to the drum motor driver IC004 pin ⑯ . The servo error voltage on pin ⑯ is inputted to the matrix circuit through the buffer amplifier and the control amplifier to control the drive amplifier output current, or the drive current of the drum motor drive coil.

The current flowing into the drive coil enters GND through R019 of IC001 pin ⑩ , so DC voltage proportional to the drive current is generated on the inversion input terminal (IC001 pin ⑧) of the control amplifier. With this current feedback, the drive current becomes proportional to the servo error voltage. In this case, the current flowing into the 3 drive coils U, V and W needs to be selected according to the drum rotation position. Therefore, the rotation position is detected by 3 hole elements to generate the drive amplifier select switch.

4-2. CAPSTAN SERVO

4-2-1. Capstan FG Amplifier

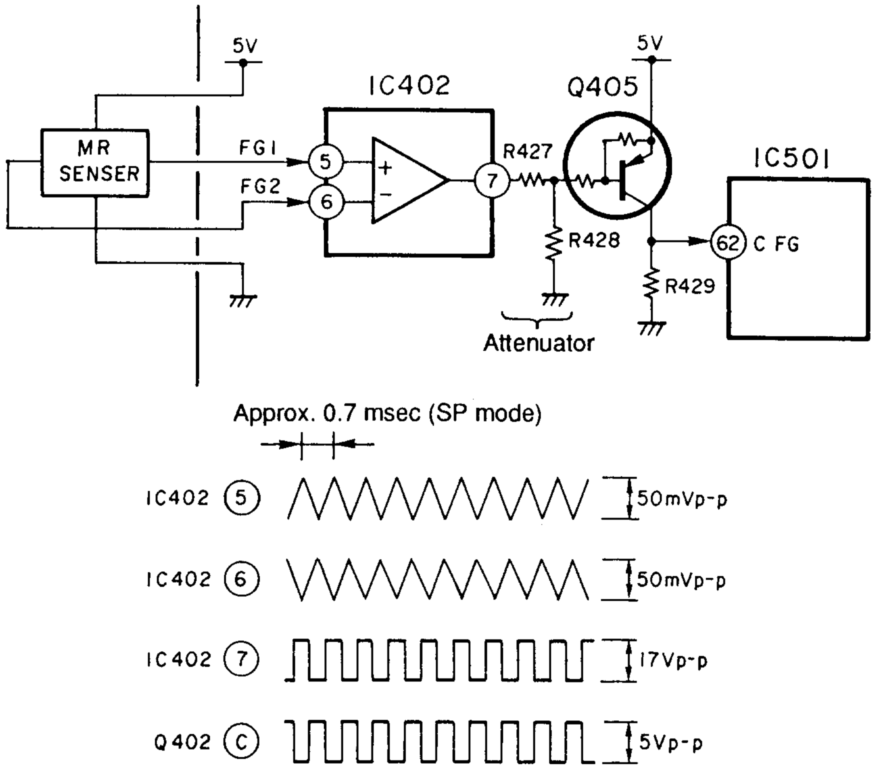

5V
IC402
5V
Q405
MR SENSER
FG1
FG2
5
6
+
-
7
R427
IC501
R428
62
C FG
R429
Attenuator
Approx. 0.7 msec (SP mode)
IC402 ⑤
50mVp-p
IC402 ⑥
50mVp-p
IC402 ⑦
17Vp-p
Q402 Ⓒ
5Vp-p

Fig. 4-6

Since wave (SP mode, approx. 1515 Hz) is generated in the MR sensor when the capstan rotor is running. This sine wave is amplified in differential mode by IC402 and its waveform is shaped by Q405 so that 5Vp-p pulse is inputted to the system control microprocessor (IC501).

Capstan FG pulse with 720 waves is obtained at one rotation of capstan.

4-2-2. PB CTL Circuit

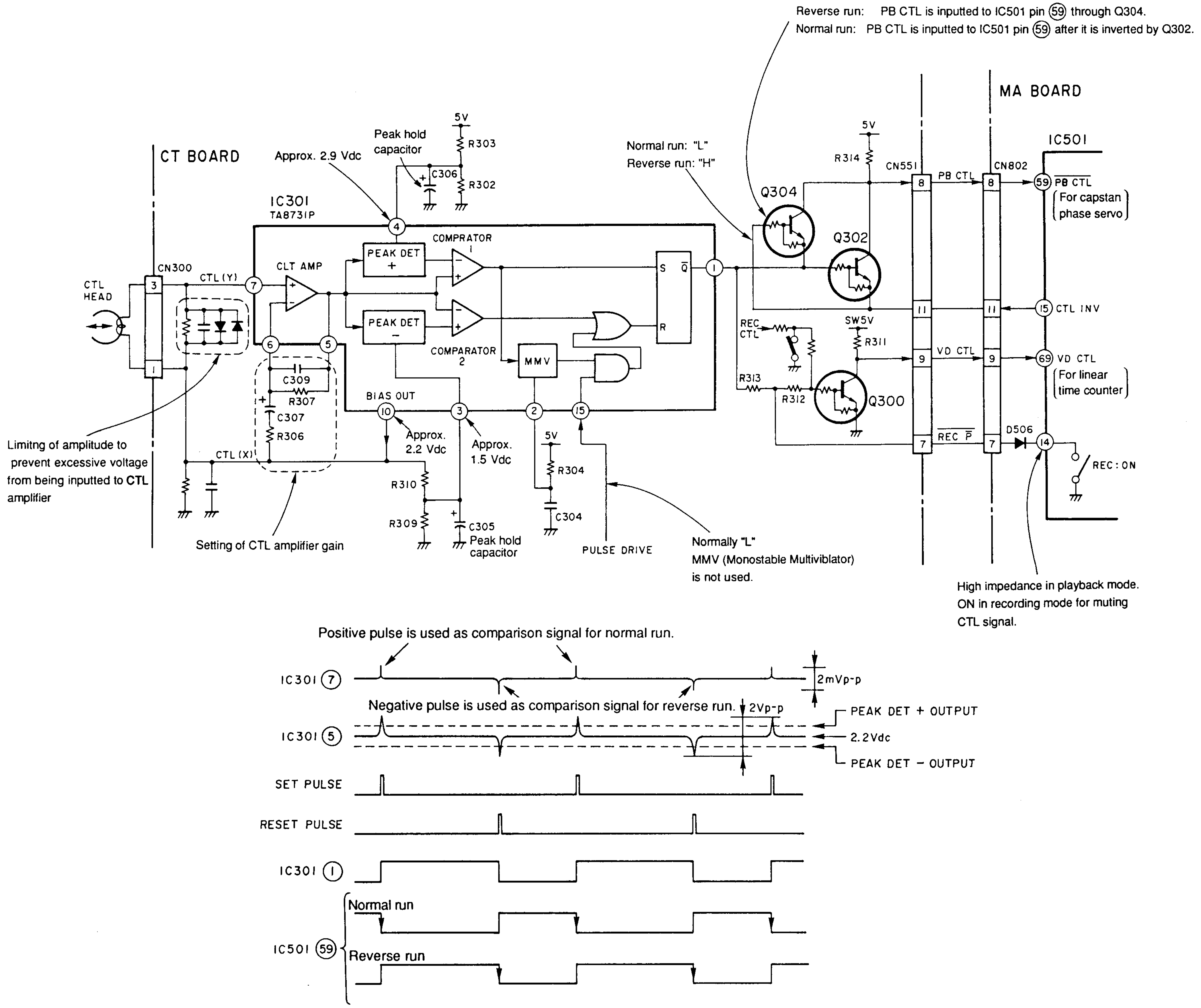

Reverse run: PB CTL is inputted to IC501 pin (59) through Q304.
Normal run: PB CTL is inputted to IC501 pin (59) after it is inverted by Q302.
MA BOARD
CT BOARD
IC501
IC301
TA8731P
Approx. 2.9 Vdc
Peak hold capacitor
5V
R303
R302
C306
Normal run: "L"
Reverse run: "H"
Q304
Q302
Q300
R314
CN551
CN802
PB CTL
For capstan phase servo
CTL INV
VD CTL
For linear time counter
REC P
D506
REC:ON
CN300
CTL HEAD
CTL (Y)
CTL (X)
CLT AMP
PEAK DET +
PEAK DET −
COMPRATOR 1
COMPARATOR 2
MMV
BIAS OUT
Approx. 2.2 Vdc
Approx. 1.5 Vdc
C309
R307
C307
R306
R310
R309
C305
Peak hold capacitor
R304
C304
PULSE DRIVE
REC CTL
R313
R312
SW5V
R311
Limitng of amplitude to prevent excessive voltage from being inputted to CTL amplifier
Setting of CTL amplifier gain
Normally "L" MMV (Monostable Multiviblator) is not used.
High impedance in playback mode. ON in recording mode for muting CTL signal.
Positive pulse is used as comparison signal for normal run.
IC301 ⑦
2mVp-p
Negative pulse is used as comparison signal for reverse run.
2Vp-p
IC301 ⑤
PEAK DET + OUTPUT
2.2Vdc
PEAK DET − OUTPUT
SET PULSE
RESET PULSE
IC301 ①
IC501 (59)
Normal run
Reverse run

Fig. 4-7

(1) CTL amplifier

PB CTL signal is linear amplified to 100 times by CTL amplifier of IC301 pins ⑤ - ⑦ .

(2) Wave shaping circuit

The positive pulse of PB CTL signal is compared with the positive peak detect voltage (*1) by the comparator 1 to generate flip-flop set pulse,while the negative pulse of PB CTL signal is compared with the negative peak detect voltage (*1) by the comparator 2 to generate flip-flop reset pulse.

Flip-flop output (pin ①) becomes set status ("H" level) with the positive pulse of PB CTL signal and then becomes reset status ("L" level) with the negative pulse.

Thus, the PB CTL signal shaped to square wave is obtained as output signal.

*1: Strictly speaking, this is an average of peak voltage and bias voltage (approx. 2.2V).

(3) CTL inversion circuit

PB CTL signal output from IC301 pin ① is inverted by Q302 and is inputted to the system control microprocessor IC501 pin (59) .

The system control microprocessor uses the fall (┐) of $\overline{\text{PB CTL}}$ signal as a comparison signal of the capstan phase servo.

Also, PB CTL signal output from IC301 pin ① is inverted by Q300 and is inputted to the system control microprocessor pin (64) . The system control microprocessor uses this VD CTL signal for the linear time counter.

(4) CTL polarity selection

CTL INV signal becomes"H" in the reverse run mode. So, Q304 turns ON and the signal is inputted to IC501 pin (59) without inverting PB CTL signal.

Since the polarity of PB CTL signal is inverted in normal and reverse run modes, a correct capstan phase error cannot be obtained. Therefore, PB CTL signal of the same polarity is inputted to the system control microprocessor without regard to the direction of tape run.

4-2-3. Capstan Servo Process

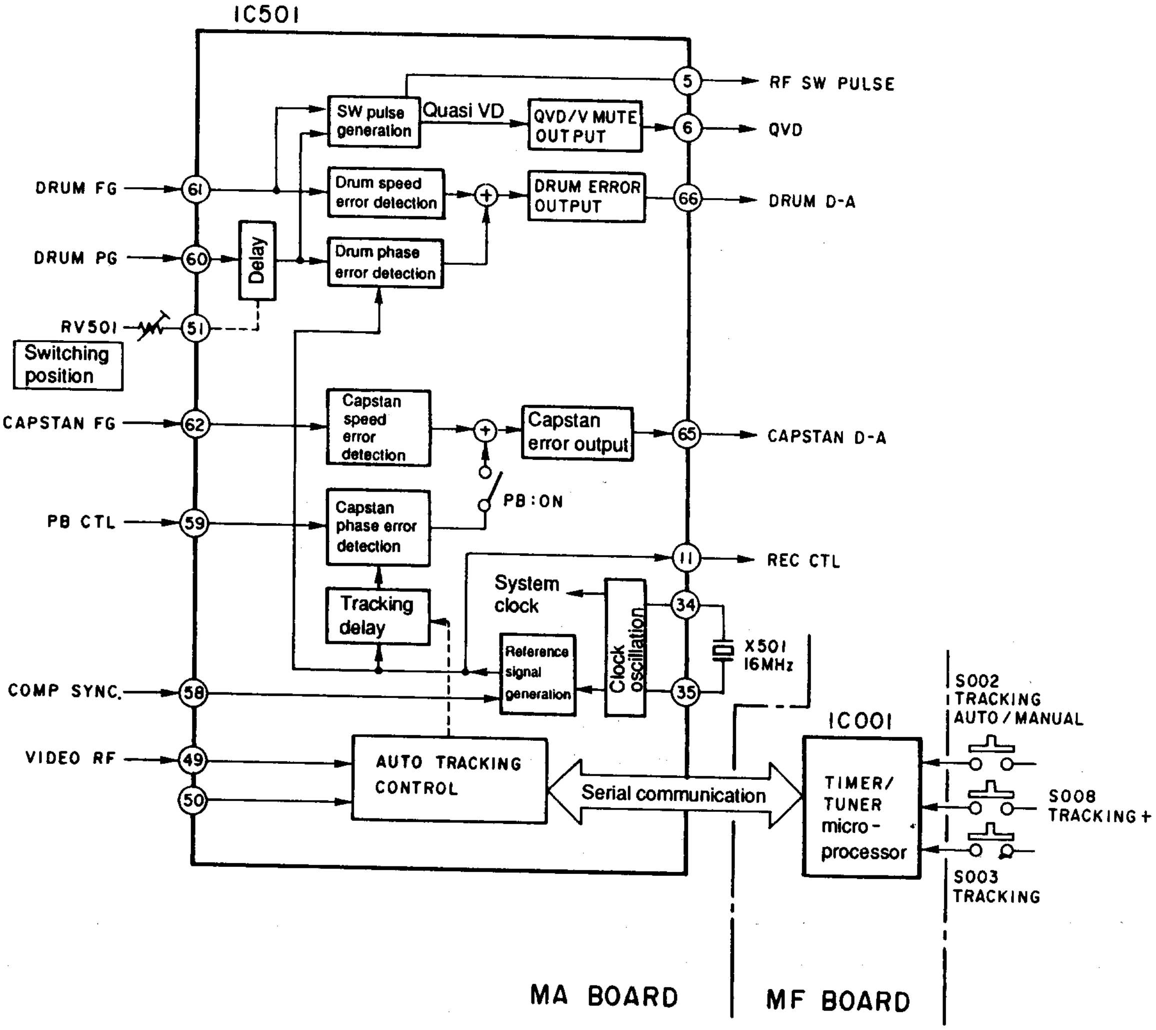

IC501
SW pulse generation
Quasi VD
QVD/V MUTE OUTPUT
Drum speed error detection
DRUM ERROR OUTPUT
Drum phase error detection
Delay
DRUM FG
DRUM PG
RV501
Switching position
CAPSTAN FG
PB CTL
COMP SYNC.
VIDEO RF
Capstan speed error detection
Capstan error output
PB:ON
Capstan phase error detection
Tracking delay
System clock
Reference signal generation
Clock oscillation
AUTO TRACKING CONTROL
Serial communication
RF SW PULSE
QVD
DRUM D-A
CAPSTAN D-A
REC CTL
X501 16MHz
IC001
TIMER/ TUNER micro-processor
S002 TRACKING AUTO/MANUAL
S008 TRACKING+
S003 TRACKING
MA BOARD
MF BOARD
61
60
51
62
59
58
49
50
5
6
66
65
11
34
35

Fig. 4-8

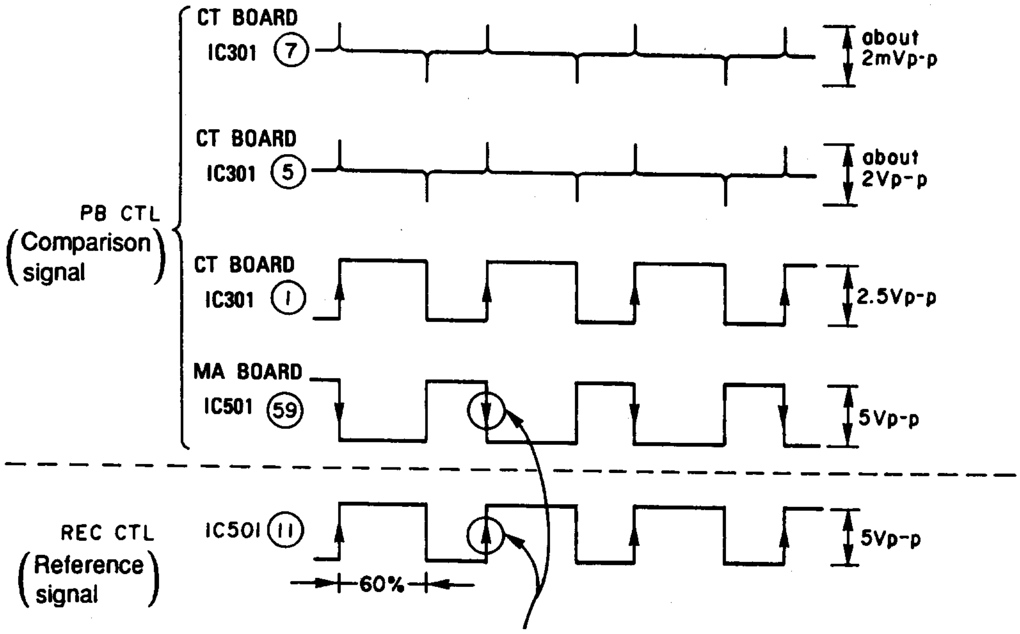
(1) Capstan speed error detection

Capstan FG signal is frequency divided and the cycle is counted as speed error. The frequency division rate and the reference value are dependent on modes (CUE, REVIEW etc.)

The capstan FG signal frequency in each mode is shown below.

Mode	Capstan FG signal frequency	
	SP	LP
REC/PB	1515 (1-fold speed)	758 (1-fold speed)
CUE	10900 (7-fold speed)	6650 (9-fold speed)
REVIEW	10200 (7-fold speed)	6950 (9-fold speed)

(2) Capstan phase error detection



PB CTL signal fall (˥) and REC CTL signal rise (ʃ) are almost the same at the center of tracking

Fig. 4-9 (FWD run)

Capstan phase error is detected only in playback mode. The phase difference between the PB CTL fall (˥) and the reference signal (delayed by tracking delay circuit) rise (ʃ) is counted as phase error.

The capstan servo functions so that the PB CTL signal fall (˥) coincides with the REC CTL signal rise (ʃ) (when the tracking delay is the center value).

In the CUE or REVIEW mode, the CTL signal is divided into 7 frequencies in SP mode. In the LP mode, it is divided into 9 frequencies to compare the phase with the reference signal. In this way, the position of the noise bar is fixed. The amount of tracking delay is set as follows.

[Auto tracking]

The system control microprocessor (IC501) measures the video RF level while changing the amount of tracking delay, and searches a maximum delay where the tracking delay is set.

[Manual tracking]

Using TRACKING + and TRACKING - buttons, the tracking delay is set to the best point while monitoring the playback picture.

(3) Capstan error output

In the recording mode, the capstan speed error is regarded as a capstan error. In the playback mode, capstan speed error is added to capstan phase error, which is regarded as a capstan error.

Capstan error is output in 3 values of "H", "L" and "HIZ".

(4) REC CTL signal output

In the playback mode, this signal is used as a comparison signal of the capstan phase circuit, so the reference signal (REC CTL signal) is recorded in the control track.

[Timing chart of capstan phase circuit in reverse run]

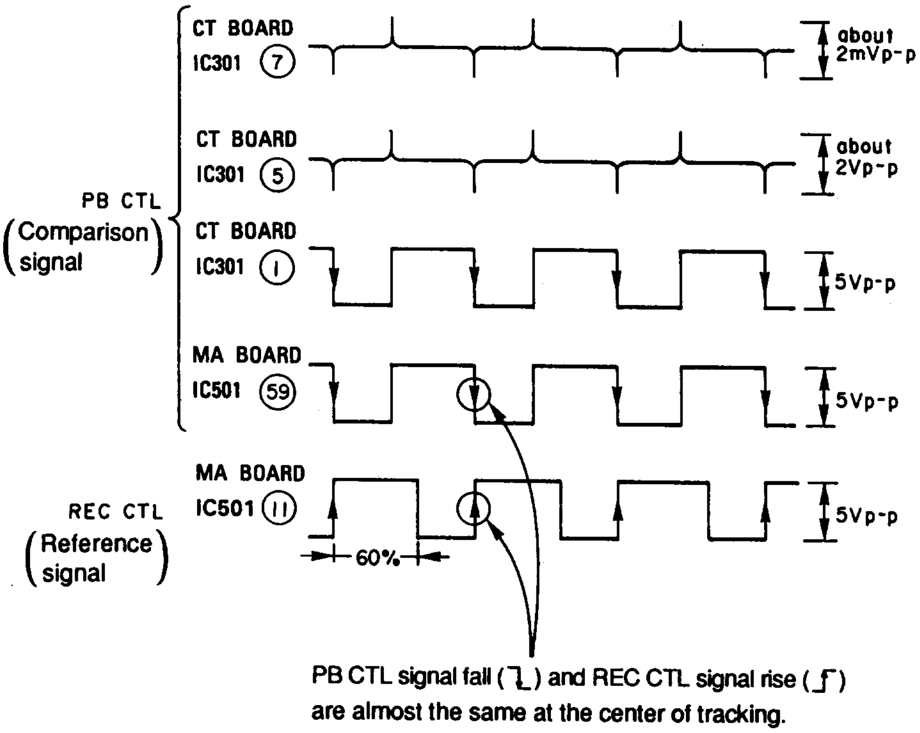

CT BOARD
IC301 ⑦
about 2mVp-p
CT BOARD
IC301 ⑤
about 2Vp-p
PB CTL
(Comparison signal)
CT BOARD
IC301 ①
5Vp-p
MA BOARD
IC501 (59)
5Vp-p
MA BOARD
IC501 ⑪
REC CTL
(Reference signal)
5Vp-p
60%
PB CTL signal fall (⌝⌞) and REC CTL signal rise (⌟⌜)
are almost the same at the center of tracking.

Fig. 4-10

4-2-4. Capstan Motor Drive Circuit

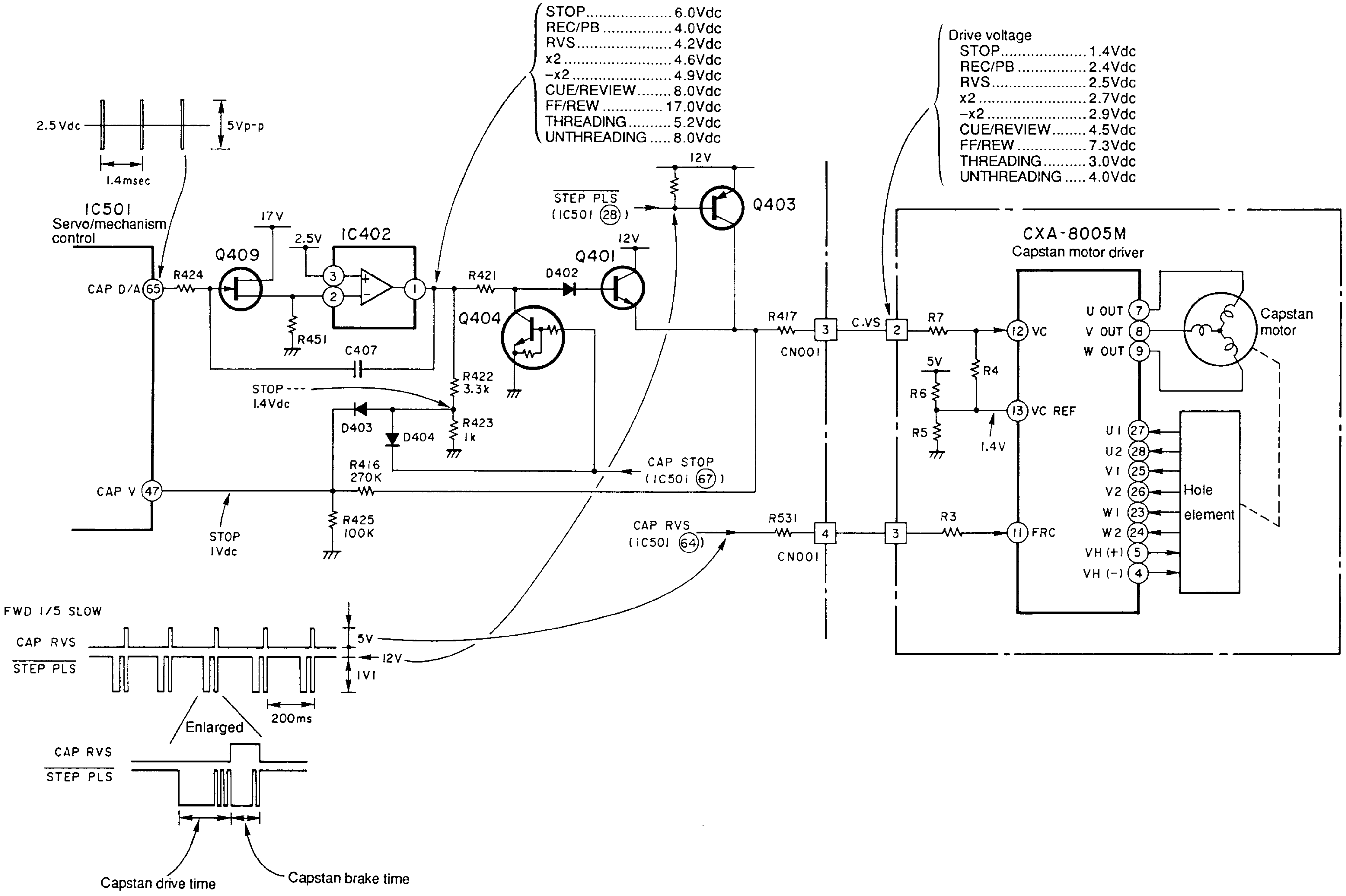

STOP 6.0Vdc
REC/PB 4.0Vdc
RVS 4.2Vdc
x2 .... 4.6Vdc
−x2 .... 4.9Vdc
CUE/REVIEW 8.0Vdc
FF/REW 17.0Vdc
THREADING 5.2Vdc
UNTHREADING 8.0Vdc
Drive voltage
STOP 1.4Vdc
REC/PB 2.4Vdc
RVS 2.5Vdc
x2 .... 2.7Vdc
−x2 .... 2.9Vdc
CUE/REVIEW 4.5Vdc
FF/REW 7.3Vdc
THREADING 3.0Vdc
UNTHREADING 4.0Vdc
2.5Vdc
5Vp-p
1.4msec
IC501
Servo/mechanism control
CAP D/A 65
R424
Q409
17V
2.5V
IC402
R451
C407
STOP --- 1.4Vdc
R421
D402
Q401
12V
Q404
R422 3.3k
R423 1k
D403
D404
R416 270K
R425 100K
CAP V 47
STOP 1Vdc
CAP STOP (IC501 67)
STEP PLS (IC501 28)
12V
Q403
R417
CN001
C.VS
CAP RVS (IC501 64)
R531
CN001
CXA-8005M
Capstan motor driver
R7
12 VC
5V
R4
R6
R5
13 VC REF
1.4V
R3
11 FRC
U OUT 7
V OUT 8
W OUT 9
Capstan motor
U1 27
U2 28
V1 25
V2 26
W1 23
W2 24
VH (+) 5
VH (−) 4
Hole element
FWD 1/5 SLOW
CAP RVS
STEP PLS
5V
12V
1V1
200ms
Enlarged
CAP RVS
STEP PLS
Capstan drive time
Capstan brake time

Fig. 4-11

(1) Integrating circuit

Capstan error is output from IC501 pin ⑥⑤ in 3 PWM signals of "H", "L" and "HIZ" (approx. 1.4 msec cycle), so it is integrated by Q409 and IC402 to obtain a capstan servo error voltage on IC402 pin ①.

(2) Capstan servo error voltage is amplified by Q401 and is inputted to the capstan motor driver. Q404 turns ON when STOP signal is "H". The capstan servo error voltage is then connected to GND to stop the capstan motor.

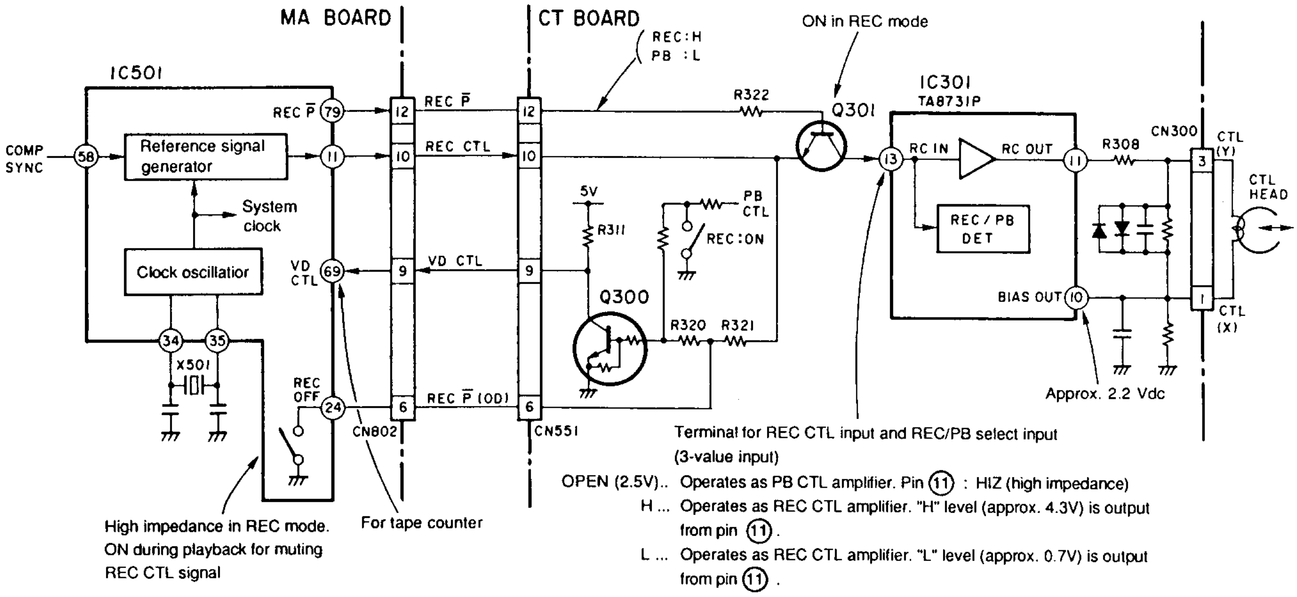
(3) Pulse drive circuit

Q403 is the capstan motor pulse drive circuit. In the slow or frame by frame playbackmotor is driven intermittently by $\overline{\text{STEP PLS}}$ signal . In the playback or recording mode, the $\overline{\text{STEP PLS}}$ signal is normally "H" so Q403 is OFF (IC501 pin ㉘ : Open drain output).

(4) Capstan motor drive circuit

Capstan motor drive voltage output from Q401 is divided by R416 and 425 and is fed back to IC501 pin ㊼ . Using this voltage, the system control microprocessor (IC501) drives the capstan motor on a constant voltage for FF, REW, tape threading/unthreading, etc.

4-2-5. REC CTL Circuit


MA BOARD
CT BOARD
IC501
COMP SYNC
58
REC P̄ 79
Reference signal generator
11
System clock
Clock oscillator
VD CTL 69
34
35
X501
REC OFF 24
CN802
12
10
9
6
REC P̄
REC CTL
VD CTL
REC P̄ (OD)
CN551
REC:H
PB :L
R322
Q301
5V
R311
PB CTL
REC:ON
Q300
R320
R321
IC301
TA8731P
13
RC IN
RC OUT
11
REC/PB DET
BIAS OUT 10
R308
CN300
3
1
CTL (Y)
CTL (X)
CTL HEAD

ON in REC mode

High impedance in REC mode. ON during playback for muting REC CTL signal

For tape counter

Approx. 2.2 Vdc

Terminal for REC CTL input and REC/PB select input (3-value input)

OPEN (2.5V).. Operates as PB CTL amplifier. Pin ⑪ : HIZ (high impedance)

H ... Operates as REC CTL amplifier. "H" level (approx. 4.3V) is output from pin ⑪.

L ... Operates as REC CTL amplifier. "L" level (approx. 0.7V) is output from pin ⑪ .

Fig. 4-12

(1) Reference signal generator

Synchronized with COMP SYNC (composite sync signal separated from input video signal) of IC501 pin (58) input to generate a servo reference signal which is output from pin ⑪ as REC CTL signal.

(2) CTL amplifier

REC CTL signal passes through Q301 and is supplied to the CTL head from the CTL amplifier IC301.

[REC CTL timing chart]

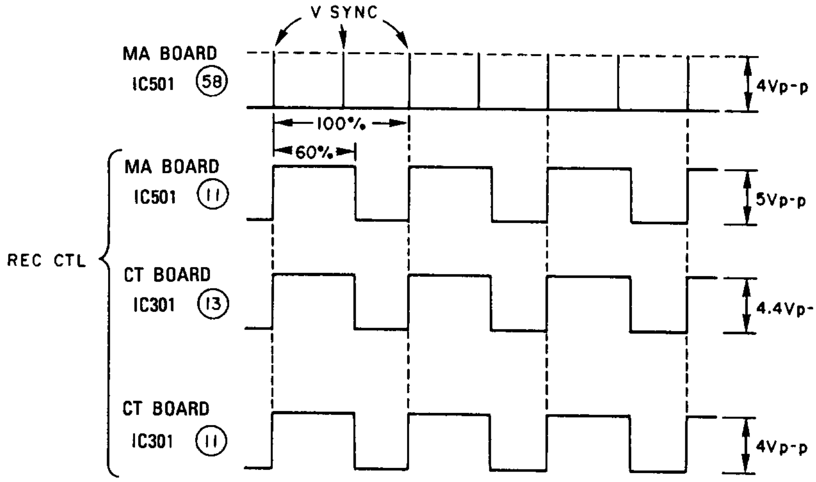


Fig. 4-13

4-2-6. PB CTL Signal Playback in Slow/Frame by Frame Mode

In the slow/frame by frame playback mode, the capstan timing is set up by PB CTL signal and capstan FG signal for proper tracking. Refer to system control circuit "2-2-5 Reverse run frame by frame playback".

[Normal run slow/frame by frame playback]

In this mode, tracking is effected by the positive pulse of PB CTL signal. Negative pulse (reset pulse) is not played depending on the timing of braking in the frame by frame playback mode so the flip-flop is fixed in the set position and hence the next positive pulse is not detected. To prevent such a phenomenon, the flip-flop reset pulse is generated by MWV (Monostable multivibrator).

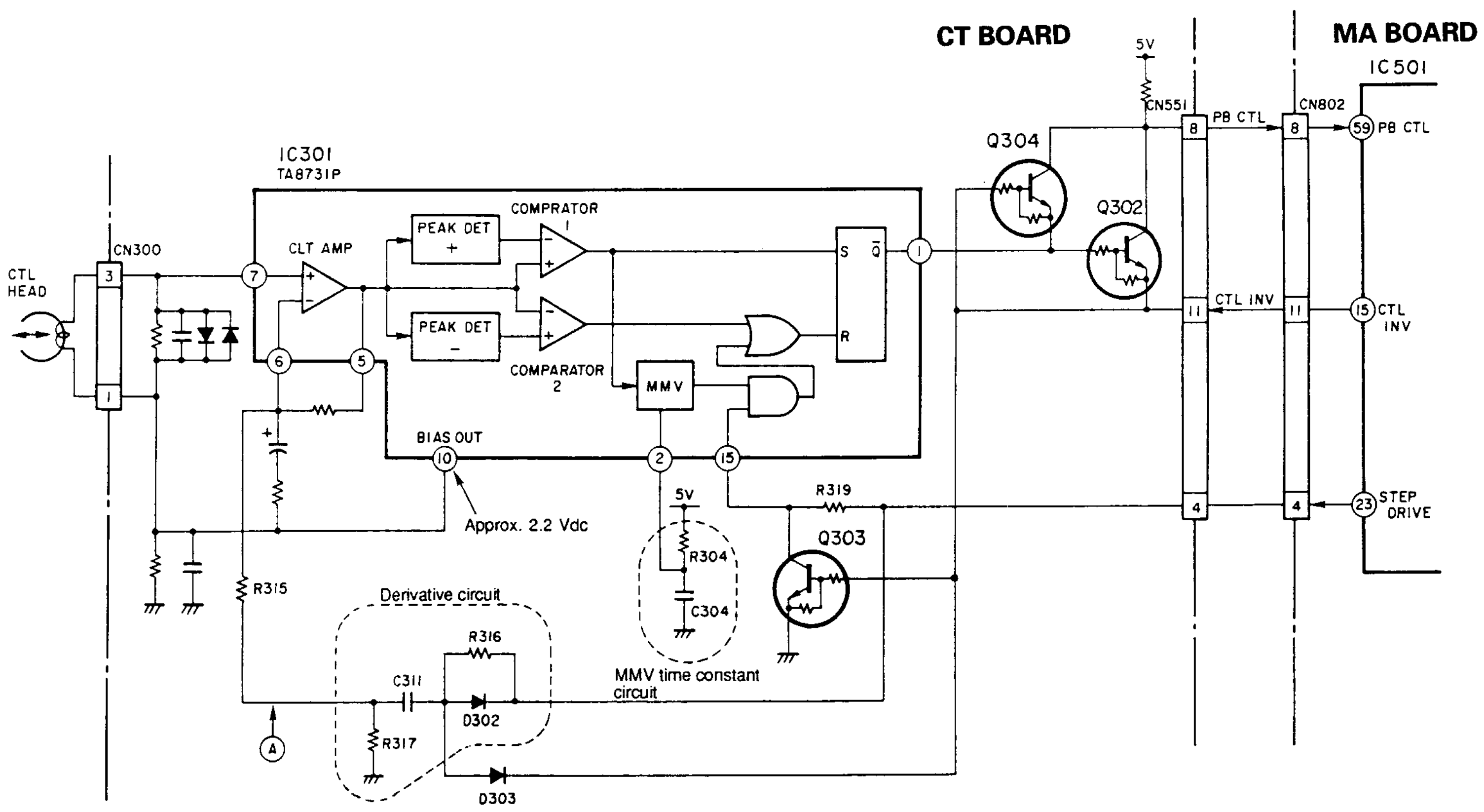
1. In the normal run mode, CTL INV signal is "L" so Q303 is OFF. Since D303 is energized, the derivative circuit is not operating.
2. At the start of tape run, the $\overline{\text{STEP PLS}}$ signal (*1) becomes "L" and the STEP DRIVE signal becomes "H". IC301 pin ⑮ becomes "H" with the STEP DRIVE signal, allowing the reset pulse to pass through the AND gate of IC301.
3. When the positive pulse of PB CTL signal is played, SET pulse is generated for setting the flip-flop. This pulse is also used to trigger MWV.
4. RESET pulse is generated about 2.5 msec after MWV is triggered to reset flip-flop.
5. When the negative pulse of PB CTL signal is played, RESET pulse is generated. This pulse does not affect the flip-flop output.
6. At the completion of capstan brake operation with $\overline{\text{STEP PLS}}$ and $\overline{\text{CAP RVS}}$ signals, SET DRIVE signal is reset to "L".

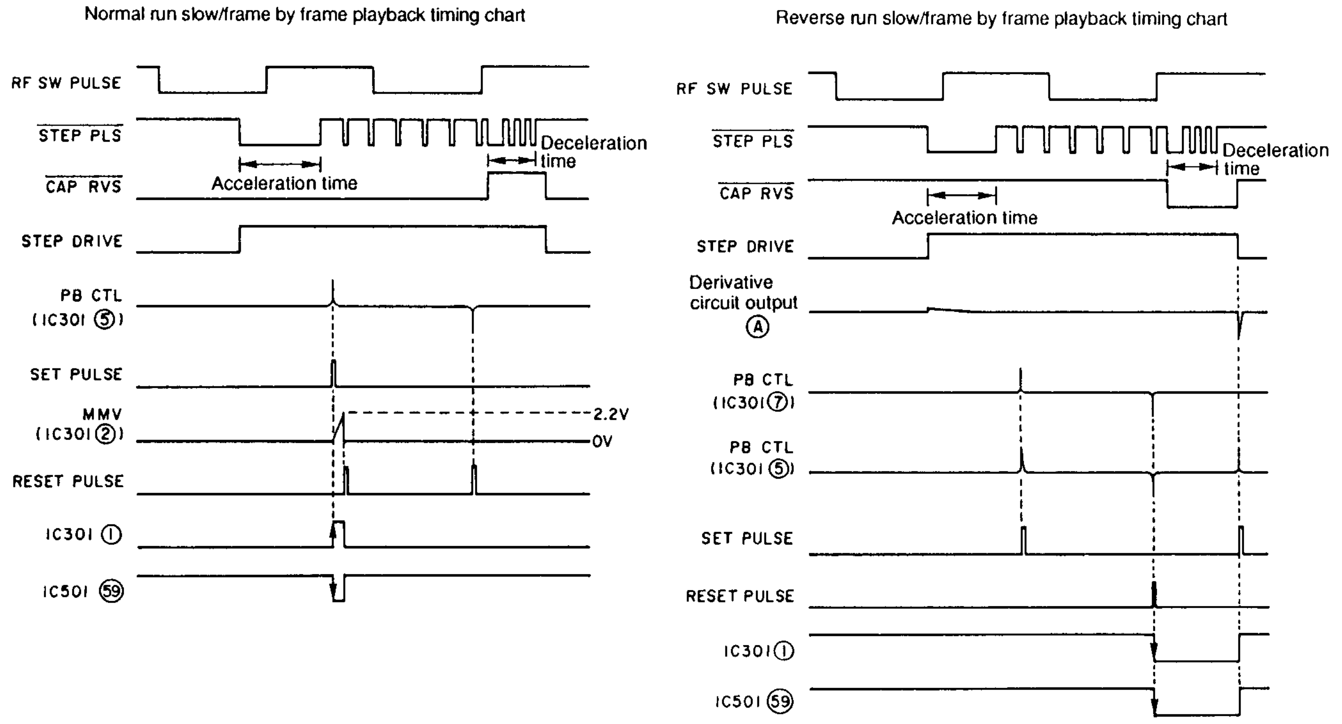
*1: Capstan step drive signal

[Reverse run slow/frame by frame playback]

In this mode, the tracking is effected by the negative pulse of PB CTL signal. The positive pulse (SET pulse) is not played depending on tape stop position so the flip-flop is reset and hence the negative pulse is not detected. To prevent such a phenomenon, the positive pulse is generated by the derivative circuit to set the flop-flop.

1. In the reverse run mode, CTL INV signal is "H" so Q304 is ON. IC301 pin ⑮ is "L" and the RESET pulse generated by MWV is invalid. Since D303 is reverse biased, the derivative circuit is ready for operation.
2. At the start of tape run, $\overline{\text{STEP PLS}}$ signal becomes "L" and the STEP DRIVE signal becomes "H". The rise (ʃ) of STEP pulse signal is blocked by D301 when the derivative pulse is not generated.
3. When the tape is running, the positive and negative pulses of PB CTL signal are played. The positive pulse may not be played depending on tape conditions. RESET pulse is generated by the negative pulse to reset the flip-flop.
4. At the completion of the capstan brake operation with $\overline{\text{STEP PLS}}$ and $\overline{\text{CAP RVS}}$ signals, STEP DRIVE signal is reset to "L". The negative pulse is generated inthe derivative circuit by the rise (ʃ) of the STEP DRIVE signal. It is inverted into a positive pulse by the CTL amplifier, and SET pulse is generated, thus setting the flip-flop.




Normal run slow/frame by frame playback timing chart

Reverse run slow/frame by frame playback timing chart

Fig. 4-14

4-2-7. Auto Tracking

[Principle of auto tracking]

As shown in Fig. 4-15, tracking is changed intentionally to measure the RF output level from which a maximum RF output level, or the best tracking point, is obtained and is set in that point.

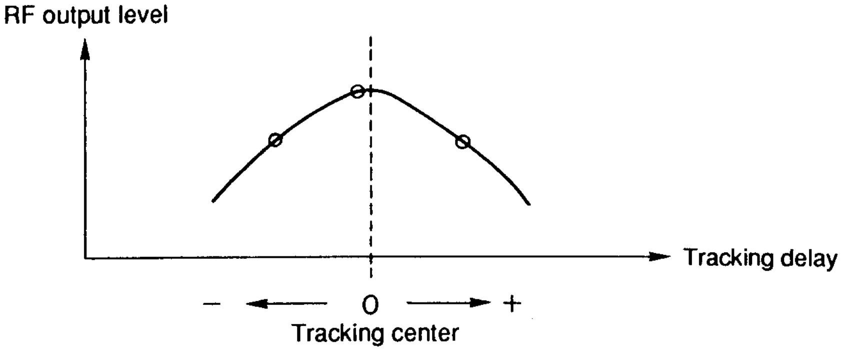


Fig. 4-15

[Tracking detection]

The condition of tracking is detected by the system control microprocessor according to the level of video RF signal.

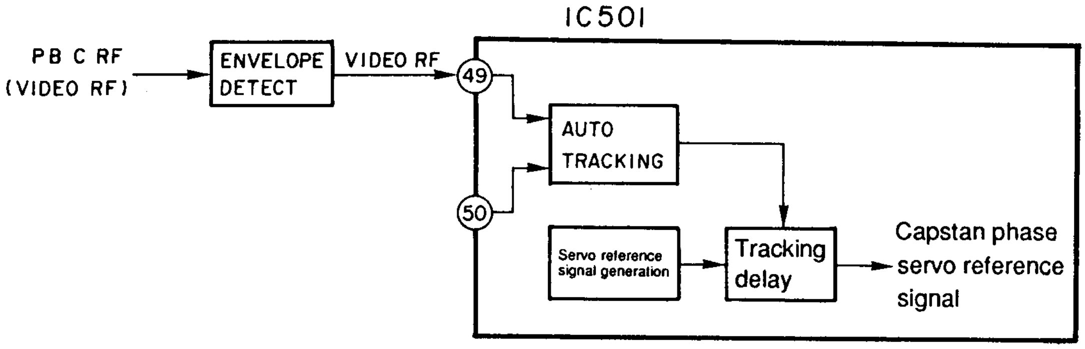

IC501
PB C RF
(VIDEO RF)
ENVELOPE DETECT
VIDEO RF
49
50
AUTO TRACKING
Servo reference signal generation
Tracking delay
Capstan phase servo reference signal

Fig. 4-16

[Auto Tracking pull-in]

This is an operation for searching a maximum point of output by changing the amount of tracking delay. At this time, the "Autographing" lamp on the front panel flickers.

The auto tracking pull-in operation is performed in the following cases.

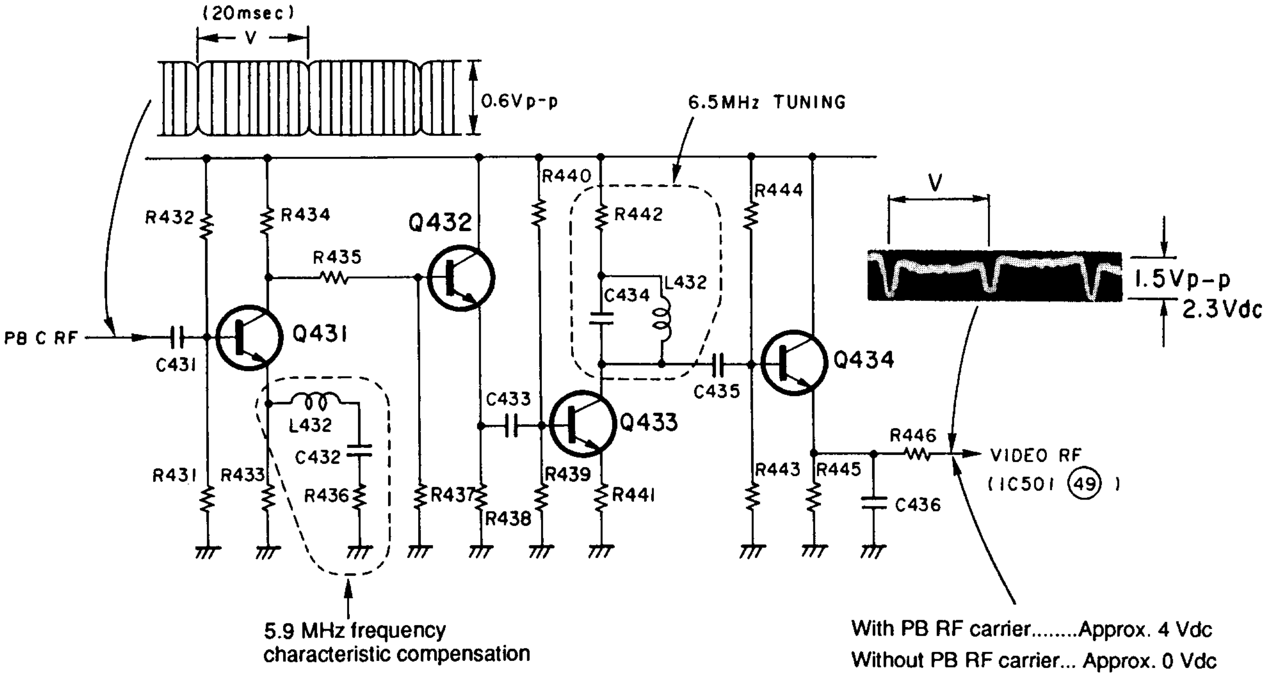
(1) When tape is played for the first time after inserting cassette.

(2) When auto tracking is set to ON by tracking AUTO/MANUAL button.

(3) When the mode (SP/LP) of recording is changed in the middle of tape being played.

(4) When video RF signal is lost for more than 4 seconds. Duting the auto tracking pull-in operation, the tracking is changed intentionally, so noise may appear in the playback picture.

[Video RF envelope detection]


(20msec)
V
0.6Vp-p
6.5MHz TUNING
R432
R434
Q432
R435
R440
R442
R444
V
1.5Vp-p
2.3Vdc
C434
L432
PB C RF
Q431
C431
Q434
C435
L432
C433
Q433
C432
R446
VIDEO RF
(IC501 ㊾)
R431
R433
R436
R437
R439
R441
R443
R445
C436
R438

5.9 MHz frequency characteristic compensation

With PB RF carrier........Approx. 4 Vdc
Without PB RF carrier... Approx. 0 Vdc

Fig. 4-17

1) The video RF signal (PB C RF in circuit diagram) from the video circuit is amplified by Q431 and Q432.

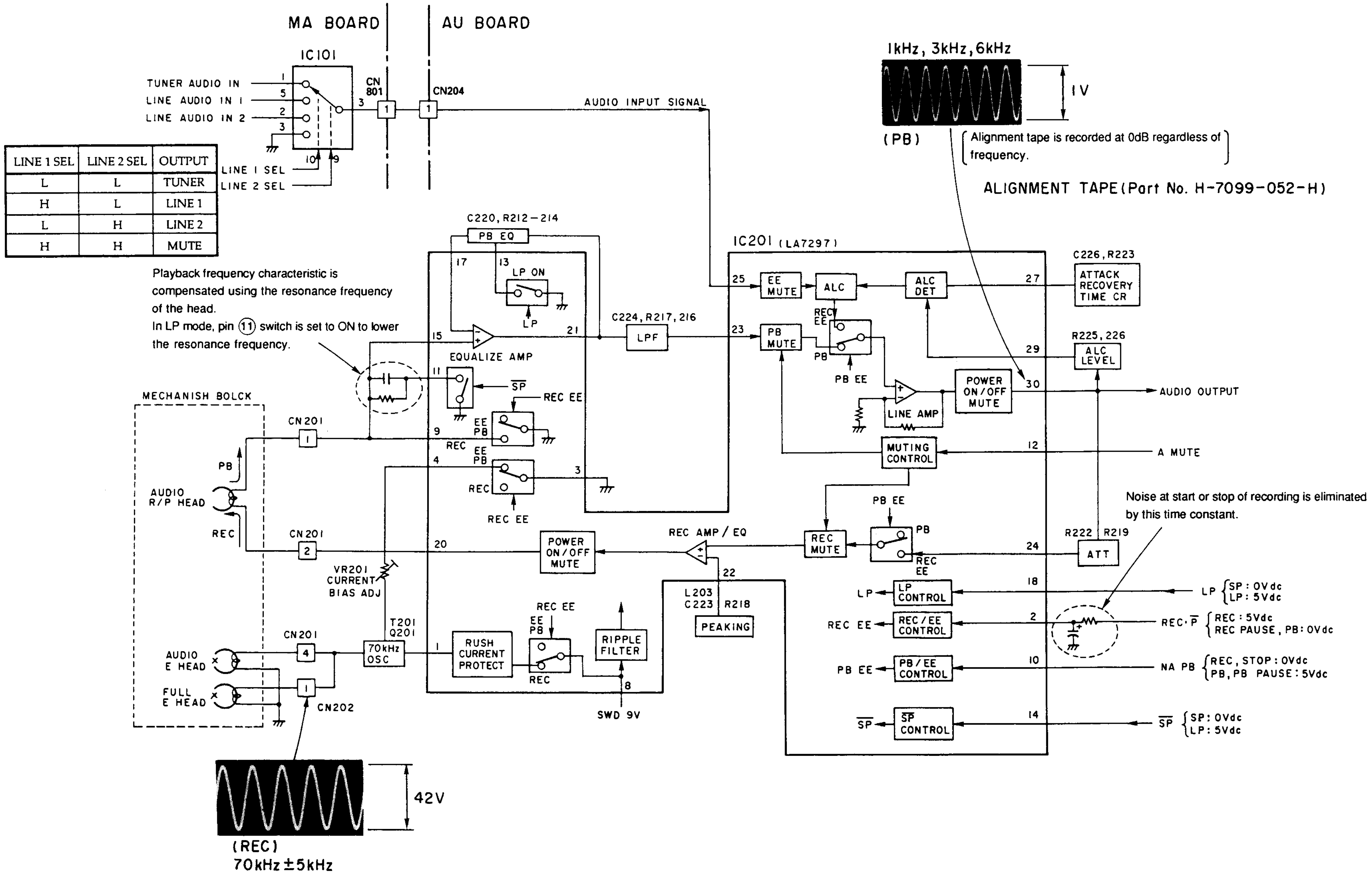
2) Frequency of about 6.5 MHz is tuning amplified by Q433 and envelope detected by Q434, which is then inputted to the system control microprocessor (IC501).

4-2-8. Functions of CTL Amplifier (TA8731P) Terminals

Pin No.	Signal name	Function
1	CTL OUT	PB CTL signal wave shaping output terminal (R/S flip-flop output termainal)
2	RTG MM	MWV time constant (C, R) connecting termainal for reset pulse generation
3	PDM	Peak hold capacitor connecting terminal for minus peak detector circuit
4	PDP	Peak hold capacitor connecting terminal for plus peak detector circuit
5	AMP OUT	PB CTL amplifier output terminal
6	NFB	PB CTL amplifier negative feedback input terminal (inversion input terminal)
7	CTL IN	PB CTL amplifier input terminal (non-inversion input terminal)
8	GND	
9	BIAS IN	Bias voltage setting terminal. When this terminal is open, the bias voltage output (pin ⑩) is approx. 2.2 Vdc.
10	BIAS OUT	Bias voltage output: Approx. 2.2 Vdc, adjustable by pin ⑨ input voltage
11	RC OUT	REC CTL amplifier output terminal, HIZ (high impedance) in PB mode (pin ⑬ open)
12	CV	Rise (ʃ) of REC CTL waveform is inclined by the capacitor connected to this terminal during INDEX write in playback mode. In this way, the rise (ʃ) of REC CTL waveform is prevented from being recorded in tape.
13	RC IN	Terminal used for REC CTL signal input and REC/PB select signal input (3-value input) PB mode Open REC mode H (REC CTL amplifier output = H) L (REC CTL amplifier output = L)
14	INDEX	Pin ⑫ circuit starts operating when this terminal is set to "H".
15	STEP	When this terminal is "H", R/S flip-flop can be reset by reset pulse generating MMV.
16	VCC	5 V

SECTION 5 AUDIO CIRCUIT

5-1. BLOCK DIAGRAM



MA BOARD
AU BOARD
IC101
TUNER AUDIO IN
LINE AUDIO IN 1
LINE AUDIO IN 2
CN 801
CN204
AUDIO INPUT SIGNAL
LINE 1 SEL
LINE 2 SEL
1kHz, 3kHz, 6kHz
1V
(PB)
ALIGNMENT TAPE (Part No. H-7099-052-H)
C220, R212-214
PB EQ
LP ON
LP
EQUALIZE AMP
SP
REC EE
C224, R217, 216
LPF
IC201 (LA7297)
EE MUTE
ALC
ALC DET
PB MUTE
PB EE
LINE AMP
POWER ON/OFF MUTE
MUTING CONTROL
C226, R223
ATTACK RECOVERY TIME CR
R225, 226
ALC LEVEL
AUDIO OUTPUT
A MUTE
MECHANISH BOLCK
CN201
AUDIO R/P HEAD
PB
REC
AUDIO E HEAD
FULL E HEAD
CN202
VR201 CURRENT BIAS ADJ
T201 Q201
70kHz OSC
RUSH CURRENT PROTECT
RIPPLE FILTER
SWD 9V
REC AMP / EQ
L203 C223
R218
PEAKING
REC MUTE
R222 R219
ATT
LP CONTROL
REC/EE CONTROL
PB/EE CONTROL
SP CONTROL
LP {SP : 0Vdc LP : 5Vdc
REC·P {REC : 5Vdc REC PAUSE, PB : 0Vdc
NA PB {REC, STOP : 0Vdc PB, PB PAUSE : 5Vdc
SP {SP : 0Vdc LP : 5Vdc
42V
(REC)
70kHz ±5kHz

LINE 1 SEL	LINE 2 SEL	OUTPUT
L	L	TUNER
H	L	LINE 1
L	H	LINE 2
H	H	MUTE

Playback frequency characteristic is compensated using the resonance frequency of the head.
In LP mode, pin ⑪ switch is set to ON to lower the resonance frequency.

[Alignment tape is recorded at 0dB regardless of frequency.]

Noise at start or stop of recording is eliminated by this time constant.

Fig. 5-1

[REC mode]

Signals from tuner an line are selected by IC101 inputted to IC201 pin ㉕ . The signal inputted to pin ㉕ passes through the REC/PB switch and LINE amplifier and is output to pin ㉚ . This signal is partly used as EE output and is partly inputted to pin ㉔ as REC signal and is output to pin ㉚ through REC amplifier. It is mixed with audio bias signal and supplied to the audio head from CN201 pin ③ .

[PB mode]

The signal picked up by the audio head is inputted to pin ⑮ and the frequency characteristic is adjusted by the equalizer amplifier, which is then output to pin ㉑ . This signal is inputted to pin ㉓ , passes through LINE amplifier and is output to pin ㉚ as a playback signal.

5-2. RECORDING CIRCUIT

[REC EQ]

This unit uses only SP recording mode, so the characteristic is not selected (pins ㉖ and ㉘ are not used.)

Signals of about 11 kHz are emphasized by approximately 10 dB.

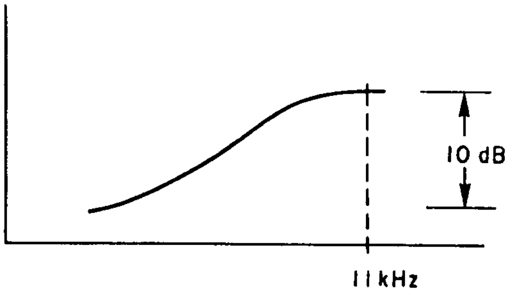


Fig. 5-2

5-3. PLAYBACK CIRCUIT

[PB EQ]

The characteristic is selected by the switches on pin ⑪ and ⑬ according to the tape speed (SP, LP).

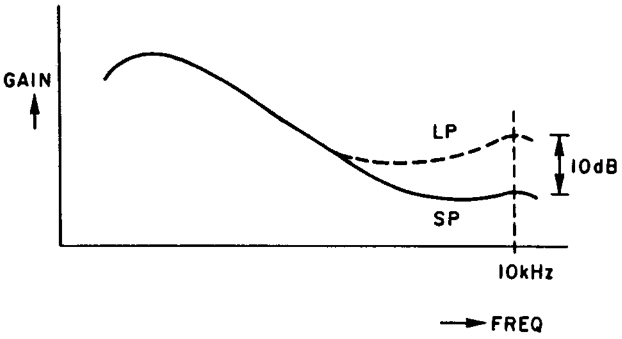


Fig. 5-3

[PB mute]

PB mute is controlled by audio mute signal on pin ⑫ input.

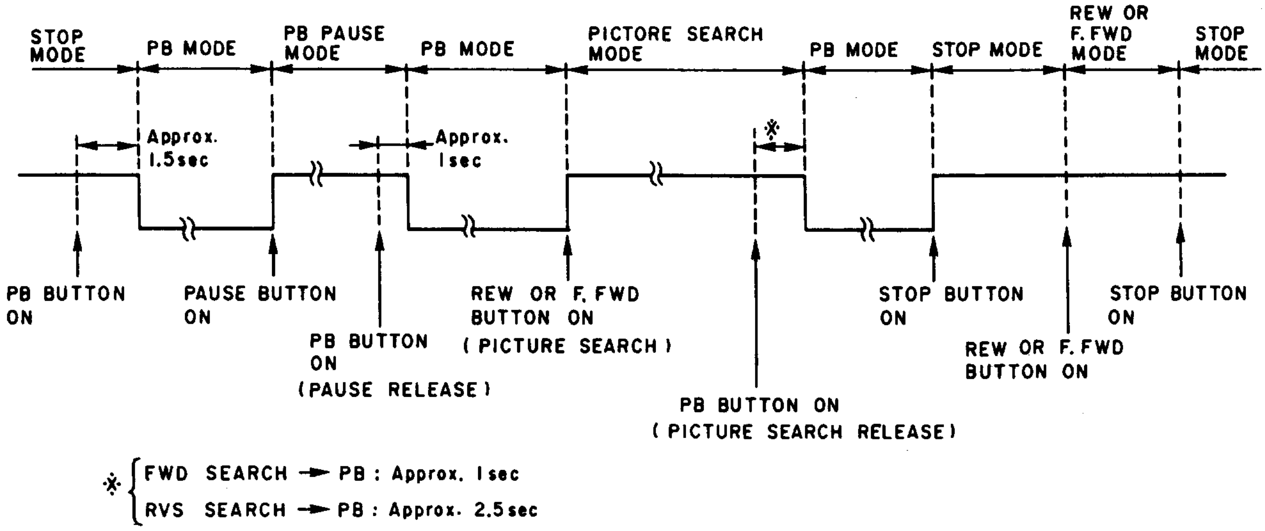

STOP MODE
PB MODE
PB PAUSE MODE
PB MODE
PICTORE SEARCH MODE
PB MODE
STOP MODE
REW OR F. FWD MODE
STOP MODE
Approx. 1.5sec
Approx. 1sec
※
PB BUTTON ON
PAUSE BUTTON ON
PB BUTTON ON (PAUSE RELEASE)
REW OR F. FWD BUTTON ON (PICTURE SEARCH)
PB BUTTON ON (PICTURE SEARCH RELEASE)
STOP BUTTON ON
REW OR F. FWD BUTTON ON
STOP BUTTON ON
※ FWD SEARCH → PB : Approx. 1sec
RVS SEARCH → PB : Approx. 2.5sec

Fig. 5-4

5-4. FUNCTIONS OF IC201 (LA7297) TERMINALS

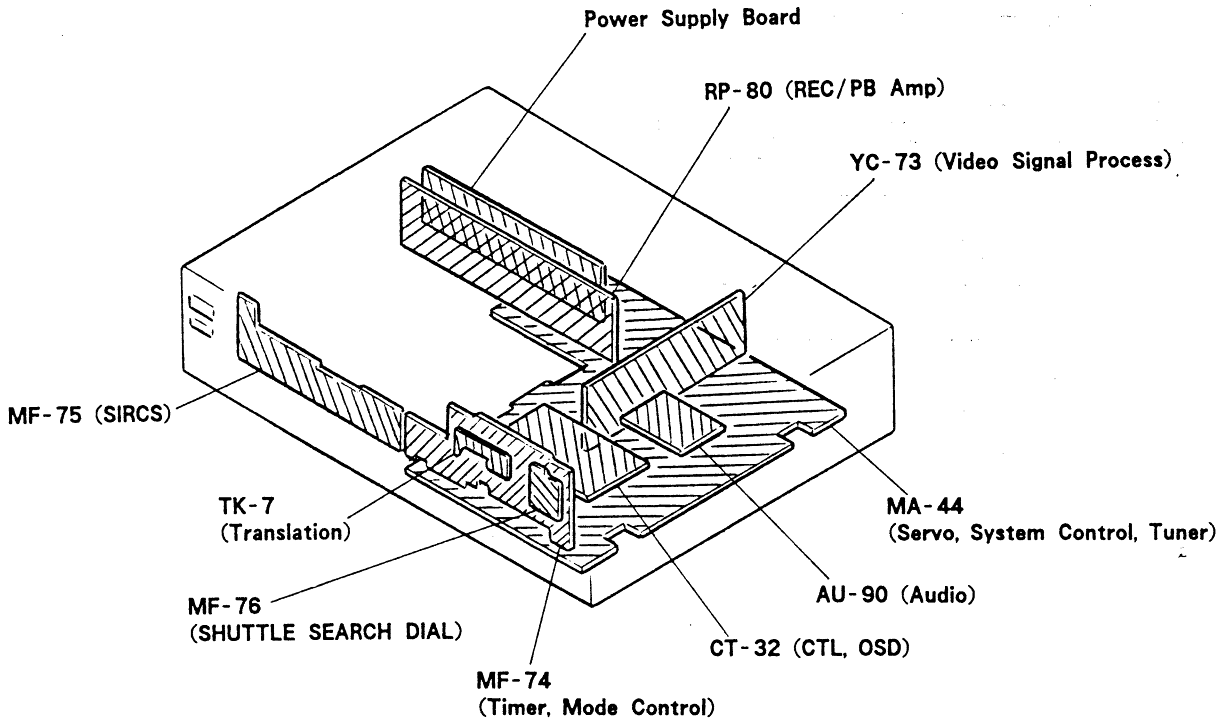
This IC is used for 3 speeds of SP/LP/EP. In this unit, it is used for 2 speeds of SP/LP.

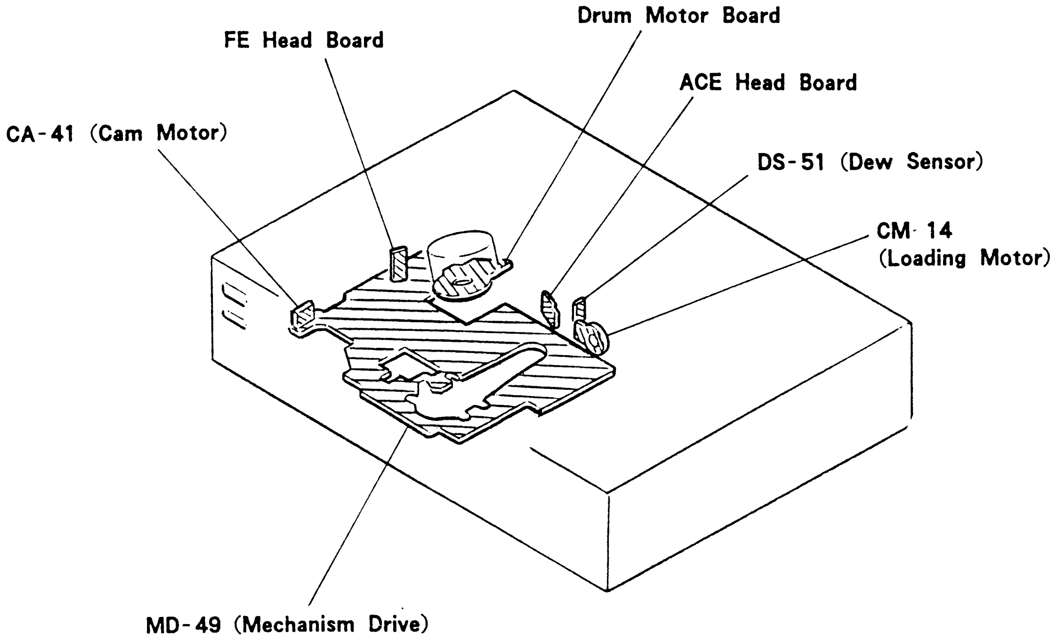
Pin No.	Function
1	Power for bias oscillator ciurcuit is output during recording. Overcurrent protective circuit is contained.
2	Recording control terminal. H: REC, L: PB
3	GND
4	Connected to GND during EE/PB
5	Ripple filter terminal connected to power source
6	Ripple filter terminal connected to filter capacitor
7	Connected to capacitor to change resonance frequency of head (Not used)
8	Power supply (SW 9 V)
9	Head switch. Connected to GND during recording
10	Playback control terminal. H: PB, L: REC
11	LP switch connected to capacitor for changing resonance frequency of head SP: OFF, LP: ON
12	Audio mute control used for REC/PB,muted at more than DC 3.3 V
13	LP/SP switch to decrease the amount of feedback of PB EQ AMP for increasing the gain of high frequencies. SP: OFF, LP: ON
14	LP control. Pin ⑪, ⑬, ㉘ switch is ON at more than DC 3 V. In this unit, SP signal is inputted.
15	Playback signal is inputted from head.
16	GND
17	EQ characteristic is obtained by negative feedback from EQ amplifier output (pin ㉑).
18	LP control. Pin ⑦, ⑬, ㉖ switch is set to ON at more than DC 3 V.
19	GND
20	REC AMP output

Pin No.	Function
21	EQ amplifier output
22	Peaking of high frequencies (characteristic) by connecting C and R to GND.
23	Playback signal input
24	Recording signal input
25	Line amplifier input
26	LP switch for changing high band peaking frequency during LP recording. Not used)
27	ALC filter. CR filter is connected to GND.
28	EP switch for changing high band peaking frequecy during EE recording. (Not used)
29	ALC detection input, line amplifier output signal (pin ㉚) is inputted.
30	Line amplifier output.

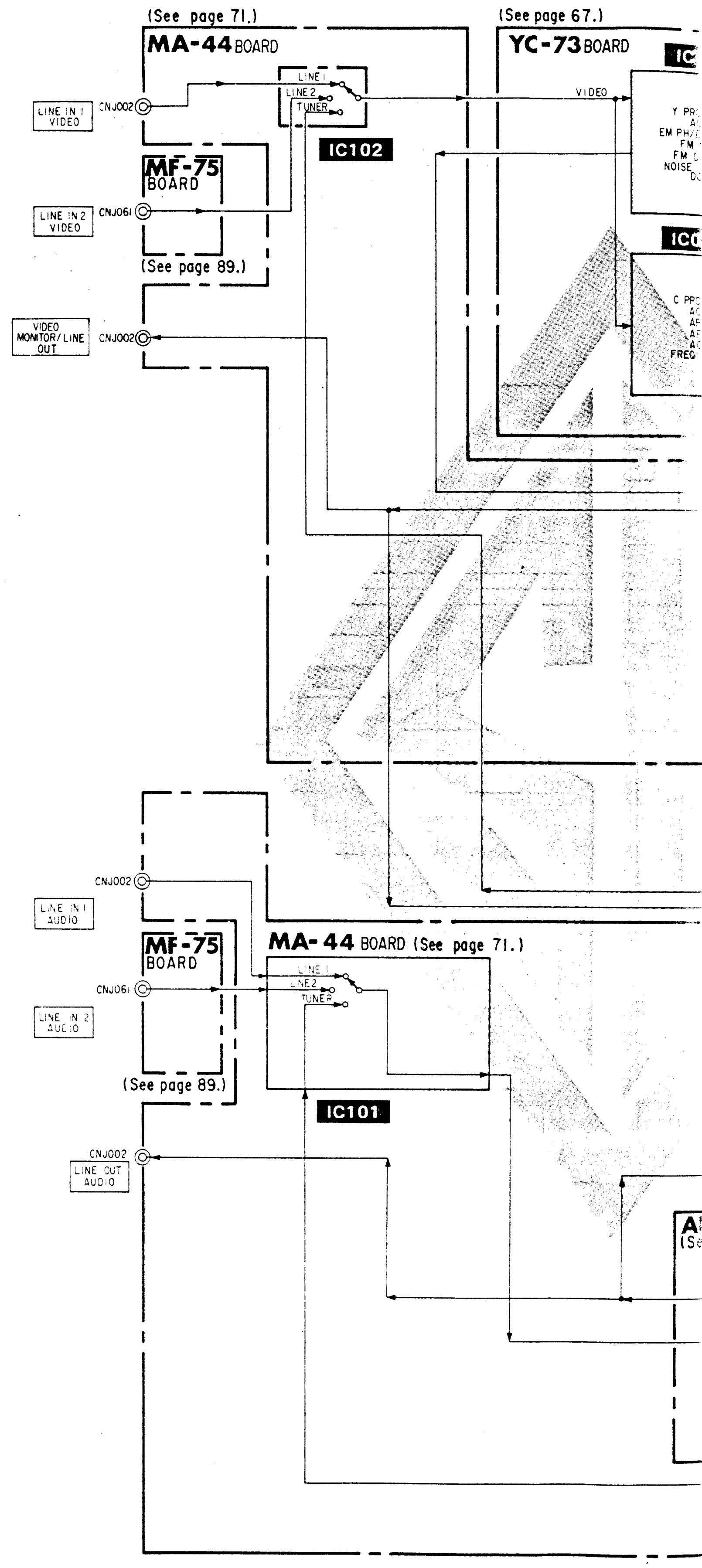
SECTION 3
DIAGRAMS

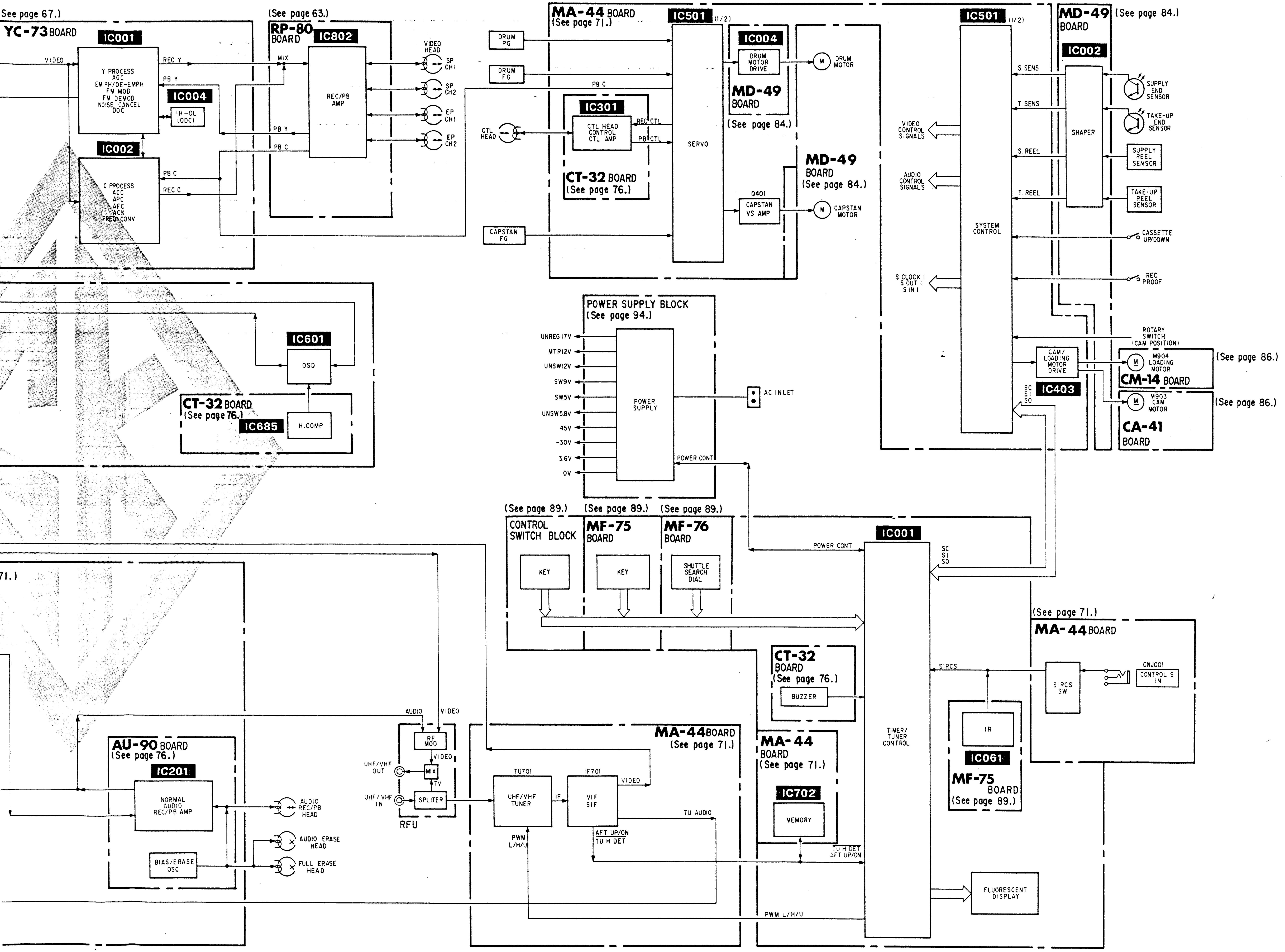
3-1. CIRCUIT BOARDS LOCATION


Power Supply Board
RP-80 (REC/PB Amp)
YC-73 (Video Signal Process)
MF-75 (SIRCS)
TK-7
(Translation)
MA-44
(Servo, System Control, Tuner)
AU-90 (Audio)
MF-76
(SHUTTLE SEARCH DIAL)
CT-32 (CTL, OSD)
MF-74
(Timer, Mode Control)

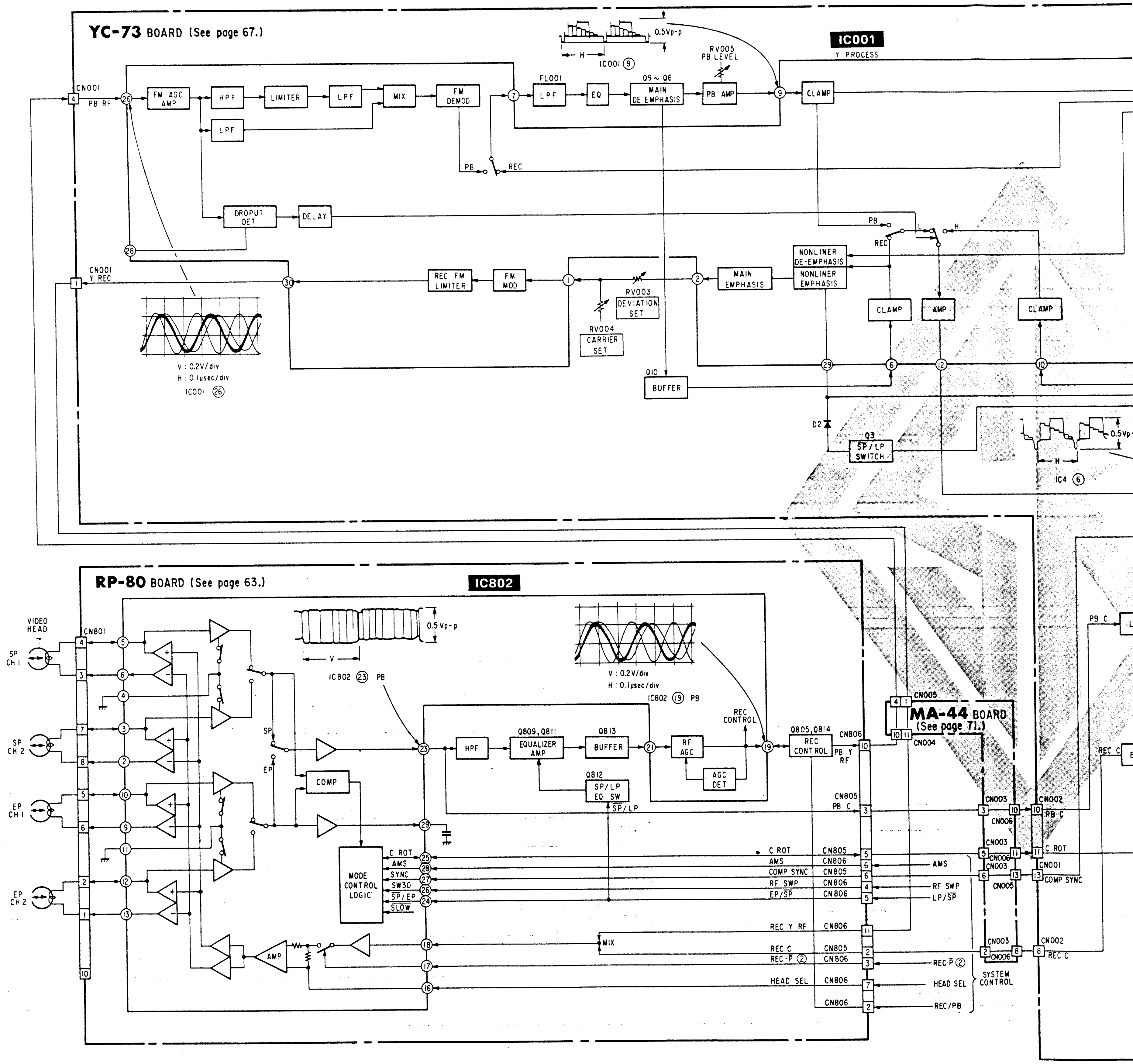

Drum Motor Board
FE Head Board
ACE Head Board
CA-41 (Cam Motor)
DS-51 (Dew Sensor)
CM-14
(Loading Motor)
MD-49 (Mechanism Drive)

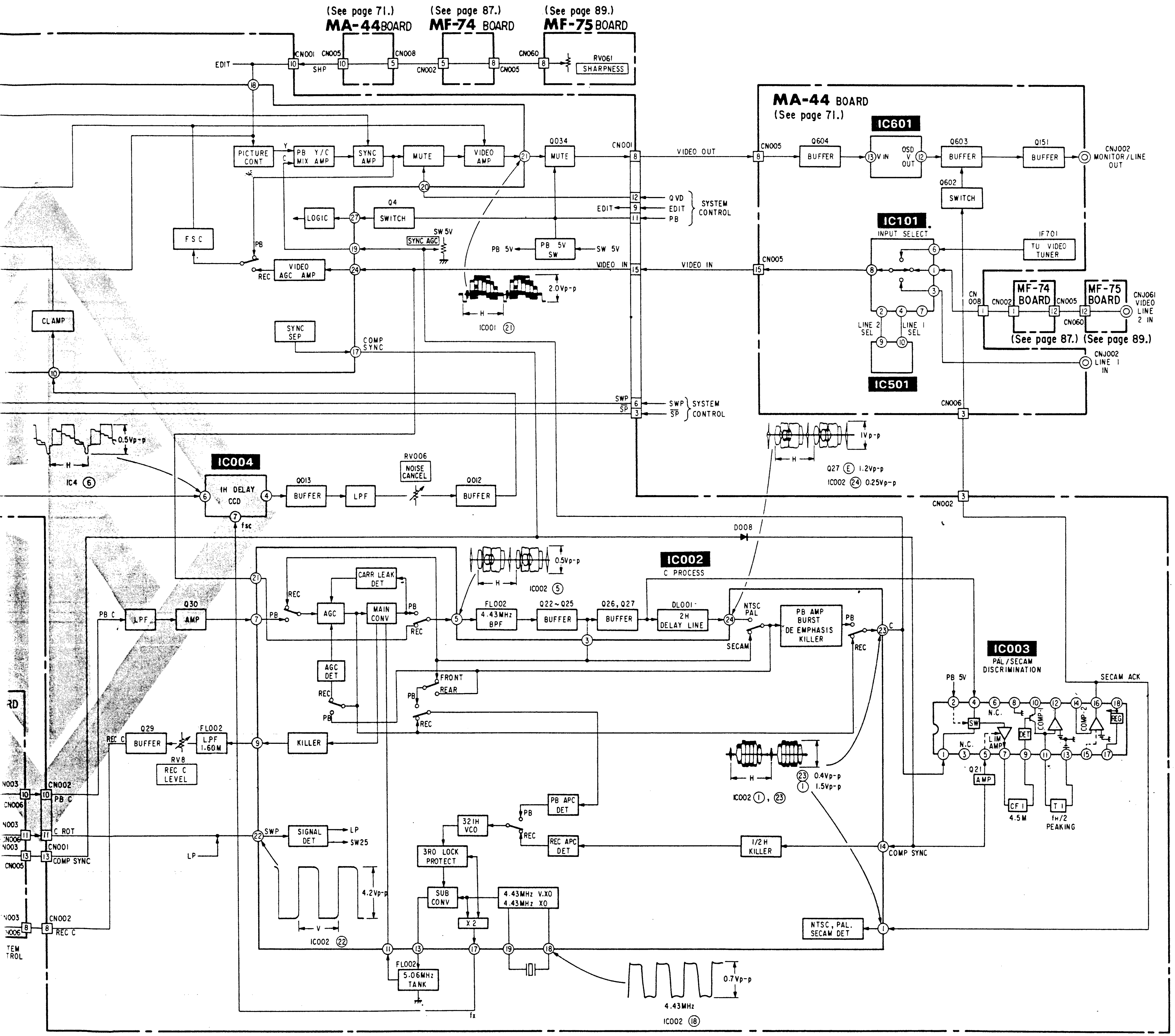
3-2. OVERALL BLOCK DIAGRAM


(See page 71.)
MA-44 BOARD
(See page 67.)
YC-73 BOARD
LINE IN 1 VIDEO
CNJ002
LINE 1
LINE 2
TUNER
VIDEO
IC102
MF-75 BOARD
LINE IN 2 VIDEO
CNJ061
(See page 89.)
VIDEO MONITOR/LINE OUT
CNJ002
CNJ002
LINE IN 1 AUDIO
MF-75 BOARD
MA-44 BOARD (See page 71.)
CNJ061
LINE IN 2 AUDIO
LINE 1
LINE 2
TUNER
(See page 89.)
IC101
CNJ002
LINE OUT AUDIO

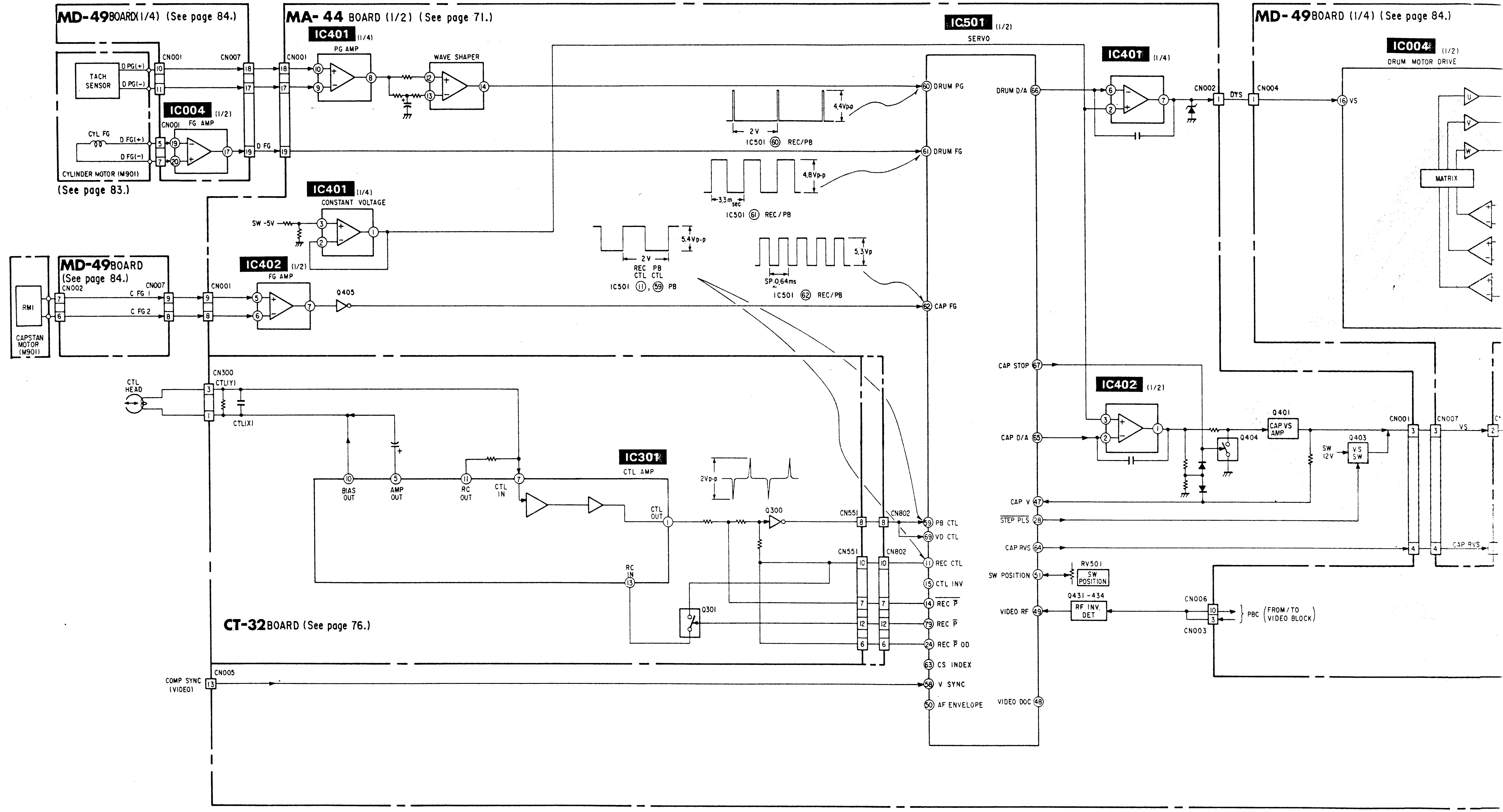

See page 67.)
YC-73 BOARD
IC001
VIDEO
Y PROCESS
AGC
EMPH/DE-EMPH
FM MOD
FM DEMOD
NOISE CANCEL
DOC
REC Y
PB Y
IC004
1H-DL
(DOC)
IC002
C PROCESS
ACC
APC
AFC
ACK
FREQ CONV
PB C
REC C
(See page 63.)
RP-80 BOARD
IC802
MIX
PB Y
PB C
REC/PB AMP
VIDEO HEAD
SP CH1
SP CH2
EP CH1
EP CH2
MA-44 BOARD
(See page 71.)
IC501 (1/2)
DRUM PG
DRUM FG
PB C
CTL HEAD
IC301
CTL HEAD CONTROL CTL AMP
REC CTL
PB CTL
CT-32 BOARD
(See page 76.)
SERVO
CAPSTAN FG
IC004
DRUM MOTOR DRIVE
DRUM MOTOR
MD-49 BOARD
(See page 84.)
MD-49 BOARD
(See page 84.)
Q401
CAPSTAN VS AMP
CAPSTAN MOTOR
IC501 (1/2)
S. SENS
T. SENS
S. REEL
T. REEL
VIDEO CONTROL SIGNALS
AUDIO CONTROL SIGNALS
SYSTEM CONTROL
S CLOCK 1
S OUT 1
S IN 1
MD-49 BOARD
(See page 84.)
IC002
SHAPER
SUPPLY END SENSOR
TAKE-UP END SENSOR
SUPPLY REEL SENSOR
TAKE-UP REEL SENSOR
CASSETTE UP/DOWN
REC PROOF
ROTARY SWITCH (CAM POSITION)
CAM/LOADING MOTOR DRIVE
IC403
SC
SI
SO
M904 LOADING MOTOR
CM-14 BOARD
(See page 86.)
M903 CAM MOTOR
CA-41 BOARD
(See page 86.)
IC601
OSD
CT-32 BOARD
(See page 76.)
IC685
H.COMP
POWER SUPPLY BLOCK
(See page 94.)
UNREG17V
MTR12V
UNSW12V
SW9V
SW5V
UNSW5.8V
45V
-30V
3.6V
0V
POWER SUPPLY
POWER CONT
AC INLET
(See page 89.)
CONTROL SWITCH BLOCK
KEY
(See page 89.)
MF-75 BOARD
KEY
(See page 89.)
MF-76 BOARD
SHUTTLE SEARCH DIAL
IC001
POWER CONT
SC
SI
SO
TIMER/TUNER CONTROL
71.)
CT-32 BOARD
(See page 76.)
BUZZER
SIRCS
(See page 71.)
MA-44 BOARD
SIRCS SW
CNJ001
CONTROL S IN
IR
IC061
MF-75 BOARD
(See page 89.)
AUDIO
VIDEO
RF MOD
VIDEO
UHF/VHF OUT
MIX
TV
UHF/VHF IN
SPLITER
RFU
AU-90 BOARD
(See page 76.)
IC201
NORMAL AUDIO REC/PB AMP
AUDIO REC/PB HEAD
BIAS/ERASE OSC
AUDIO ERASE HEAD
FULL ERASE HEAD
MA-44 BOARD
(See page 71.)
TU701
UHF/VHF TUNER
IF
IF701
VIF SIF
VIDEO
TU AUDIO
PWM L/H/U
AFT UP/ON
TU H DET
MA-44 BOARD
(See page 71.)
IC702
MEMORY
TU H DET
AFT UP/ON
PWM L/H/U
FLUORESCENT DISPLAY

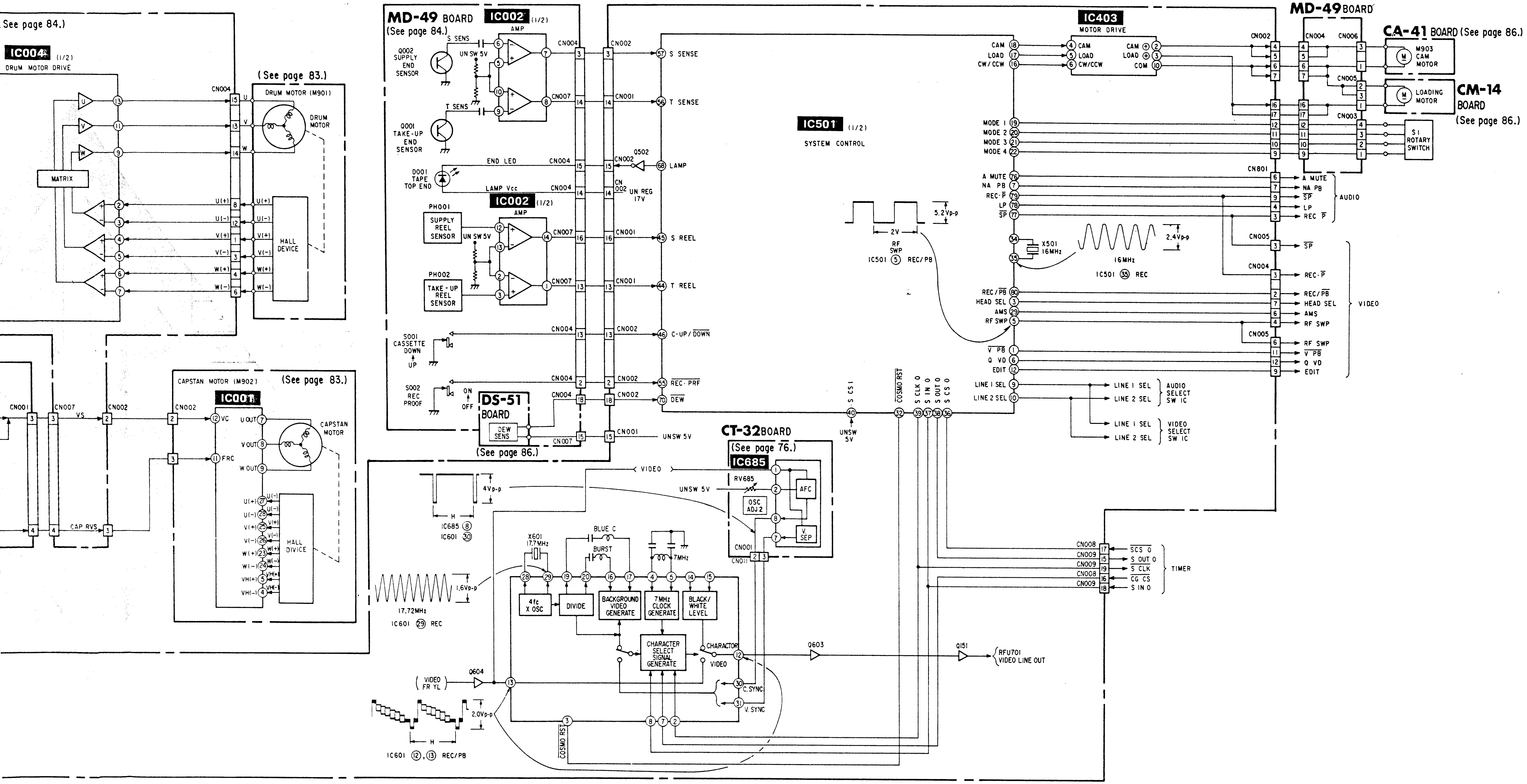
3-3. VIDEO BLOCK DIAGRAM


YC-73 BOARD (See page 67.)
IC001
Y PROCESS
CN001
PB RF
Y REC
FM AGC AMP
HPF
LIMITER
LPF
MIX
FM DEMOD
DROPUT DET
DELAY
REC FM LIMITER
FM MOD
FL001
EQ
Q9 ~ Q6
MAIN DE EMPHASIS
RV005
PB LEVEL
PB AMP
CLAMP
PB
REC
L
H
NONLINER DE-EMPHASIS
NONLINER EMPHASIS
MAIN EMPHASIS
RV003
DEVIATION SET
RV004
CARRIER SET
Q10
BUFFER
AMP
D2
Q3
SP/LP SWITCH
0.5Vp-p
IC001 ⑨
IC4 ⑥
V : 0.2V/div
H : 0.1μsec/div
IC001 ㉖
RP-80 BOARD (See page 63.)
IC802
VIDEO HEAD
SP CH 1
SP CH 2
EP CH 1
EP CH 2
CN801
SP
EP
COMP
IC802 ㉓ PB
V
0.5Vp-p
V : 0.2V/div
H : 0.1μsec/div
IC802 ⑲ PB
HPF
Q809, Q811
EQUALIZER AMP
Q813
BUFFER
RF AGC
AGC DET
Q812
SP/LP EQ SW
SP/LP
REC CONTROL
Q805, Q814
REC CONTROL
PB Y RF
MODE CONTROL LOGIC
C ROT
AMS
SYNC
SW30
SP/EP
SLOW
COMP SYNC
RF SWP
EP/SP
REC Y RF
REC C
REC-P ②
HEAD SEL
MIX
AMP
CN805
CN806
PB C
MA-44 BOARD (See page 71.)
CN005
CN004
CN003
CN006
CN002
CN001
AMS
RF SWP
LP/SP
REC-P ②
HEAD SEL
REC/PB
SYSTEM CONTROL
COMP SYNC
REC C


(See page 71.)
MA-44 BOARD
(See page 87.)
MF-74 BOARD
(See page 89.)
MF-75 BOARD
EDIT
CN001
SHP
CN005
CN008
CN002
CN060
RV061
SHARPNESS
MA-44 BOARD
(See page 71.)
IC601
PICTURE CONT
PB Y/C MIX AMP
SYNC AMP
MUTE
VIDEO AMP
Q034
MUTE
VIDEO OUT
Q604
BUFFER
V IN
OSD V OUT
Q603
BUFFER
Q151
BUFFER
CNJ002 MONITOR/LINE OUT
Q602
SWITCH
QVD
EDIT
PB
SYSTEM CONTROL
LOGIC
Q4
SWITCH
IC101
INPUT SELECT
IF701
TU VIDEO TUNER
FSC
SYNC AGC
SW 5V
PB 5V
PB 5V SW
SW 5V
VIDEO IN
REC
VIDEO AGC AMP
2.0Vp-p
H
IC001 ㉑
CN008
MF-74 BOARD
MF-75 BOARD
CNJ061 VIDEO LINE 2 IN
LINE 2 SEL
LINE 1 SEL
(See page 87.)
(See page 89.)
CLAMP
SYNC SEP
COMP SYNC
CNJ002 LINE 1 IN
IC501
SWP
SP
CN006
0.5Vp-p
IC4 ⑥
1Vp-p
Q27 Ⓔ 1.2Vp-p
IC002 ㉔ 0.25Vp-p
IC004
1H DELAY CCD
fsc
Q013
BUFFER
LPF
RV006
NOISE CANCEL
Q012
BUFFER
D008
0.5Vp-p
IC002 ⑤
IC002
C PROCESS
CARR LEAK DET
AGC
MAIN CONV
FL002
4.43MHz BPF
Q22~Q25
BUFFER
Q26, Q27
BUFFER
DL001
2H DELAY LINE
NTSC
PAL
SECAM
PB AMP BURST DE EMPHASIS KILLER
PB C
LPF
Q30
AMP
AGC DET
FRONT
REAR
IC003
PAL/SECAM DISCRIMINATION
PB 5V
SECAM ACK
SW
N.C.
LIM AMP
DET
COMP-1
COMP-2
REG
Q21
AMP
CF1
4.5M
T1
fH/2 PEAKING
REC C
Q29
BUFFER
FL002
LPF 1.60M
RV8
REC C LEVEL
KILLER
0.4Vp-p
1.5Vp-p
IC002 ①, ㉓
CN003
CN002
CN006
C ROT
CN001
COMP SYNC
CN005
SWP
SIGNAL DET
LP
SW25
PB APC DET
321H VCO
REC APC DET
1/2H KILLER
3RO LOCK PROTECT
SUB CONV
4.43MHz V.XO
4.43MHz XO
X2
4.2Vp-p
V
IC002 ㉒
NTSC, PAL, SECAM DET
FL002
5.06MHz TANK
fx
0.7Vp-p
4.43MHz
IC002 ⑱
SYSTEM CONTROL

3-4. SERVO,SYSTEM CONTROL BLOCK DIAGRAM


MD-49BOARD(1/4) (See page 84.)
TACH SENSOR
D PG(+)
D PG(-)
CN001
CN007
IC004 (1/2)
FG AMP
CYL FG
D FG(+)
D FG(-)
D FG
CYLINDER MOTOR (M901)
(See page 83.)
MA-44 BOARD (1/2) (See page 71.)
IC401 (1/4)
PG AMP
WAVE SHAPER
IC401 (1/4)
CONSTANT VOLTAGE
SW -5V
MD-49BOARD
(See page 84.)
CN002
CN007
C FG 1
C FG 2
RM1
CAPSTAN MOTOR (M901)
IC402 (1/2)
FG AMP
Q405
CN300
CTL HEAD
CTL(Y)
CTL(X)
IC301
CTL AMP
BIAS OUT
AMP OUT
RC OUT
CTL IN
CTL OUT
RC IN
2Vp-p
Q300
Q301
CN551
CN802
CT-32BOARD (See page 76.)
COMP SYNC (VIDEO)
CN005
IC501 (1/2)
SERVO
4.4Vp-p
2V
IC501 ⑥⓪ REC/PB
4.8Vp-p
3.3msec
IC501 ⑥① REC/PB
5.4Vp-p
2V
REC CTL
PB CTL
IC501 ⑪, ⑤⑨ PB
5.3Vp
SP 0.64ms
IC501 ⑥② REC/PB
⑥⓪ DRUM PG
⑥① DRUM FG
⑥② CAP FG
⑤⑨ PB CTL
⑥⑨ VD CTL
⑪ REC CTL
⑮ CTL INV
⑭ REC P̄
⑦⑨ REC P̄
㉔ REC P̄ OD
⑥③ CS INDEX
⑤⑧ V SYNC
⑤⓪ AF ENVELOPE
DRUM D/A ⑥⑥
CAP STOP ⑥⑦
CAP D/A ⑥⑤
CAP V ④⑦
STEP PLS ㉘
CAP RVS ⑥④
SW POSITION ⑤①
VIDEO RF ④⑨
VIDEO DOC ④⑧
IC401 (1/4)
CN002
DYS
CN004
IC402 (1/2)
Q401
CAP VS AMP
Q404
SW 12V
Q403
VS SW
CN001
CN007
VS
CAP RVS
RV501
SW POSITION
Q431-434
RF INV. DET
CN006
CN003
PBC (FROM/TO VIDEO BLOCK)
MD-49BOARD (1/4) (See page 84.)
IC004 (1/2)
DRUM MOTOR DRIVE
⑯ VS
U
V
W
MATRIX


See page 84.)
IC004 (1/2)
DRUM MOTOR DRIVE
MATRIX
(See page 83.)
DRUM MOTOR (M901)
DRUM MOTOR
HALL DEVICE
CN004
CAPSTAN MOTOR (M902)
(See page 83.)
IC001
CAPSTAN MOTOR
HALL DIVICE
CN001
CN007
CN002
VS
VC
FRC
CAP RVS
MD-49 BOARD
(See page 84.)
IC002 (1/2)
AMP
S SENS
Q002 SUPPLY END SENSOR
T SENS
Q001 TAKE-UP END SENSOR
UN SW 5V
D001 TAPE TOP END
END LED
LAMP Vcc
Q502
UN REG 17V
PH001 SUPPLY REEL SENSOR
PH002 TAKE-UP REEL SENSOR
S001 CASSETTE DOWN UP
S002 REC PROOF ON OFF
DS-51 BOARD
DEW SENS
(See page 86.)
UNSW 5V
IC501 (1/2)
SYSTEM CONTROL
S SENSE
T SENSE
LAMP
S REEL
T REEL
C-UP/DOWN
REC·PRF
DEW
5.2Vp-p
2V
RF SWP
IC501 ⑤ REC/PB
X501 16MHz
2.4Vp-p
16MHz
IC501 ㉟ REC
S CS I
COSMO RST
S CLK O
S IN O
S OUT O
S CS O
IC403
MOTOR DRIVE
CAM
LOAD
CW/CCW
COM
(See page 84.)
MD-49 BOARD
CA-41 BOARD (See page 86.)
M903 CAM MOTOR
LOADING MOTOR
CM-14 BOARD (See page 86.)
S1 ROTARY SWITCH
MODE 1
MODE 2
MODE 3
MODE 4
CN801
A MUTE
NA PB
REC·P
LP
SP
REC P
AUDIO
CN005
CN004
REC/PB
HEAD SEL
AMS
RF SWP
V PB
Q VD
EDIT
VIDEO
LINE 1 SEL
LINE 2 SEL
AUDIO SELECT SW IC
VIDEO SELECT SW IC
CT-32 BOARD
(See page 76.)
IC685
RV685
OSC ADJ 2
AFC
V. SEP
VIDEO
4Vp-p
H
IC685 ⑧
IC601 ㉚
X601 17.7MHz
BLUE C
BURST
7MHz
4fc X OSC
DIVIDE
BACKGROUND VIDEO GENERATE
7MHz CLOCK GENERATE
BLACK/WHITE LEVEL
CHARACTER SELECT SIGNAL GENERATE
CHARACTOR
VIDEO
C.SYNC
V. SYNC
1.6Vp-p
17.72MHz
IC601 ㉙ REC
VIDEO FR YL
Q604
2.0Vp-p
IC601 ⑫, ⑬ REC/PB
Q603
Q151
RFU701 VIDEO LINE OUT
CN008
CN009
SCS O
S OUT O
S CLK
CG CS
S IN O
TIMER

3-5. SYSTEM CONTROL – VIDEO BLOCK INTERFACE

Signal Name	Pin No.	I/O	STOP/FF/REW	TAPE LOADING	TAPE UNLOADING	PB	PB•PAUSE	SLOW	× 2	CUE	REVIEW	REC	REC•PAUSE	– × 1	– × 2
$\overline{\text{V•PB}}$	MA-44 BOARD IC501 ①	O	H	H	H	L	L	L	L	L	L	H	H	L	L
HEAD SEL	MA-44 BOARD IC501 ③	O	L	L	L	L	H	*1	H	L	L	L	L	L	H
RF SW P	MA-44 BOARD IC501 ⑤	O	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
Q VD/V MUTE	MA-44 BOARD IC501 ⑥	O	L	L	L	*3	*4	*4	*4	*4	*4	L	L	*4	*4
EDIT	MA-44 BOARD IC501 ⑫	O	L	L	L	*6	*6	*6	*6	*6	*6	*6	L	*6	*6
AMS	MA-44 BOARD IC501 ㉖	O	L	L	L	L	L	L	L	L	L	L	L	*7	*7
$\overline{\text{SP}}$	MA-44 BOARD IC501 (77)	O	*8	*8	*8	*9	*9	*9	*9	*9	*9	*8	*8	L	*9
REC/$\overline{\text{P}}$	MA-44 BOARD IC501 (79)	O	L	L	L	L	L	L	L	L	L	H	L	L	L
REC	MA-44 BOARD IC501 (80)	O	L	L	L	L	L	L	L	L	L	H	H	L	L
COMP/SYNC	MA-44 BOARD IC501 (58)	I	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10
$\overline{\text{JOG}}$	MA-44 BOARD IC501 ②	O	H	H	H	H	L	L	L	L	L	H	H	L	L
LP	MA-44 BOARD IC501 (78)	O	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8

*1. "H" when the tape stops, and "L" when it runs (for approx. 40 msec).

*2. Synchronized with drum rotaition. 25 Hz 50% duty pulse.

*3. Normally "L". "H" when CTL single is not played back.

*4. V-cycle "H" pulse.

*6. Normally "L". "H" during SYNCHRO EDIT mode.

*7. HI-Z (2.5V) during SP mode, or "L" during LP mode.

*8. By SP/LP selector, "L" during SP mode, or "H" during LP mode.

*9. By the mode on the recorded tape, "L" when it is SP mode, or "H" when "LP" mode.

*10. Composite sync. signal (positive polarity).

3-6. SYSTEM CONTROL – SERVO PERIPHERAL CIRCUIT INTERFACE

Signal Name	Pin No.	I/O	STOP	FF	REW	TAPE LOADING	TAPE UNLOADING	PB	PB·PAUSE	SLOW	× 2	CUE	REVIEW	REC	REC·PAUSE
REC CTL *1	MA-44 BOARD IC501 ⑪	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
CAP STOP	MA-44 BOARD IC501 (67)	O	H	L	L	L	L	L	H	H	L	L	L	L	H
$\overline{\text{STEP PLS}}$	MA-44 BOARD IC501 ㉘	O	H	H	H	H	H	H	H	*2	H	H	H	H	H
CAP V *3	MA-44 BOARD IC501 ㊼	I													
SW POSITION *4	MA-44 BOARD IC501 (51)	I													
$\overline{\text{PB CTL}}$	MA-44 BOARD IC501 (59)	I	H	*6	*6			*1	H/L	*2	*6	*6	*6	*1	H
VD CTL	MA-44 BOARD IC501 (69)	I	H	*6	*6			*1	H	*2	*6	*6	*6	*1	H
DRUM PG	MA-44 BOARD IC501 (60)	I	L	L	L	*5	*5	*7	*7	*7	*7	*7	*7	*7	*7
DRUM FG	MA-44 BOARD IC501 (61)	I	L	L	L	*5	*5	*8	*8	*8	*8	*8	*8	*8	*8
CAP FG	MA-44 BOARD IC501 (62)	I	H/L	*6	*6	*5	*5	*6	H/L	*9	*6	*6	*6	*6	H/L
CAP RVS	MA-44 BOARD IC501 (64)	O	H	L	H	L	H	L	L	*2	L	L	H	L	L
CAP DA *14	MA-44 BOARD IC501 (65)	O	*11	L	L	*11	*11	*12	*11	*11	*12	*12	*12	*12	*11
DRUM DA *14	MA-44 BOARD IC501 (66)	O	*13	*13	*13	*13	*13	*13	*13	*13	*13	*13	*13	*13	*13
REC/$\overline{\text{P}}$	MA-44 BOARD IC501 (79)	O	L	L	L	L	L	L	L	L	L	L	L	H	L
REC/$\overline{\text{P}}$ (O.D)	MA-44 BOARD IC501 ㉔	O	L	L	L	L	L	L	L	L	L	L	L	Hi-Z	L
SLOW·STILL	MA-44 BOARD IC501 ㉗	O	L	L	L	L	L	L	H	H	L	L	L	L	L
STEP DRIVE	MA-44 BOARD IC501 ㉓	O	L	L	L	L	L	L	L	*15	L	L	L	L	L

*1. 25 Hz pulse.
*2. "L"pulse when the tape runs.
*3. Input terminal for capstan constant-voltage drive.
Used in the FF/REW mode and for cassette loading/unloading.
*4. Input terminal for switching position sdjustment.
*5. Indefinite cycle pulse.
*6. Cycle pulse proportional to a tape speed.
*7. 25 Hz "H" pulse.
*8. 300 Hz pulse.
*9. Tape run time pulse.
*11. "H" or "L" pulse in a cycle of approx. 2 msec.
*12. "H" or "L" pulse in a cycle of approx. 1.5 msec.
*13. "H" or "L" pulse in a cycle of approx. 3 msec.
*14. 3-value output of "H", "L" and HI-Z (2.5V).
*15 "H" pulse when the tape runs.

3-7. SYSTEM CONTROL – MECHANISM BLOCK INTERFACE

Signal Name	Pin No.	I/O	HI-SPEED REW	EJECTED	CASSETTE LOADING	CASSETTE UNLOADING	TAPE LOADING	TAPE UNLOADING	STOP	FF	REW	PB	PB• PAUSE	SLOW	×2	CUE	REVIEW	REC	REC PAUSE
CAM *1	MA-44 BOARD IC501 ⑱	O	L	L	L	L	H	H	L	L	L	L	L	L	L	L	L	L	L
LOAD	MA-44 BOARD IC501 ⑰	O	L	L	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L
CW/CCW	MA-44 BOARD IC501 ⑯	O			H	L	H	L											
MODE 1	MA-44 BOARD IC501 ⑲	I	H	L	L	L	H	H	L	H	H	H	L	L	H	H	H	H	H
MODE2	MA-44 BOARD IC501 ⑳	I	L	H	H	H	H	H	L	L	L	L	H	H	L	L	L	L	H
MODE 3	MA-44 BOARD IC501 ㉑	I	H	H	H	H	L	L	L	L	L	H	H	H	H	H	L	H	H
MODE 4	MA-44 BOARD IC501 ㉒	I	H	H	H	H	H	H	L	H	H	L	L	L	L	L	L	L	L
REC PRF	MA-44 BOARD IC501 (55)	I	*2	L	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
C-UP/DOWN	MA-44 BOARD IC501 ㊻	I	L	H	H→L	H→L	L	L	L	L	L	L	L	L	L	L	L	L	L
T REEL	MA-44 BOARD IC501 ㊹	I	*3	H/L	H/L	H/L	H/L	H/L	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
S REEL	MA-44 BOARD IC501 ㊺	I	*3	H/L	H/L	H/L	*3	*3	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
LAMP	MA-44 BOARD IC501 (68)	O	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
CAP V	MA-44 BOARD IC501 ㊼	I	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
CAP STOP	MA-44 BOARD IC501 (67)	O	L	H			L	L	H	L	L	L	H	H	L	L	L	L	H
CAP RVS	MA-44 BOARD IC501 (64)	O	H	H			L	H	H/L	L	H	L	L	L	L	L	H	L	L
CAP DA *8	MA-44 BOARD IC501 (65)	O																	
T SENS	MA-44 BOARD IC501 (56)	I	*7	*4	*4	*4	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
S SENS	MA-44 BOARD IC501 (57)	I	*7	*4	*4	*4	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7

*1. "H" when progressing to the MECHA mode.
*2. "L" when a cassette erasure preventive finger is bent, and "H" when not bent.
*3. Cycle pulse proportional to a reel speed.
*4. "H" pulse in a cycle of approx. 2 msec.
*6. Input terminal for capstant constant-voltage drive.
Used in the FF/REW mode and for cassette loading/unloading.
*7. Narmally "L", "H" pulse in a cycle of 2 msec. when tape top or tape end is detected.
*8. 3-value output of "H", "L" and HI-Z (2.5V).

3-8. SYSTEM CONTROL – SYSYTEM CONTROL PERIPHERAL CIRCUIT INTERFACE

Signal Name	Pin No.	I/O	I/O LEVEL
$\overline{\text{RESET}}$	MA-44 BOARD IC501 ㉜	I	Normally "H". Set to "L" when a power failure is delected or power is restored.
$\overline{\text{S CS 0}}$	MA-44 BOARD IC501 ㊱	I	Chip select signal from the timer microcomputer (MF-74 board IC101). V-cycle "L" pulse.
S IN 0	MA-44 BOARD IC501 ㊲	I	Serial communication data from the timer microcomputer. V-cycle "L" pulse.
S OUT 0	MA-44 BOARD IC501 ㊳	O	Serial communication data to the timer microcomputer. V-cycle "L" pulse.
$\overline{\text{S CLK 0}}$	MA-44 BOARD IC501 ㊴	I/O	Serial communication clock to/from the timer microcomputer. V-cycle "L" pulse.

3-9. SYSTEM CONTROL – AUDIO BLOCK INTERFACE

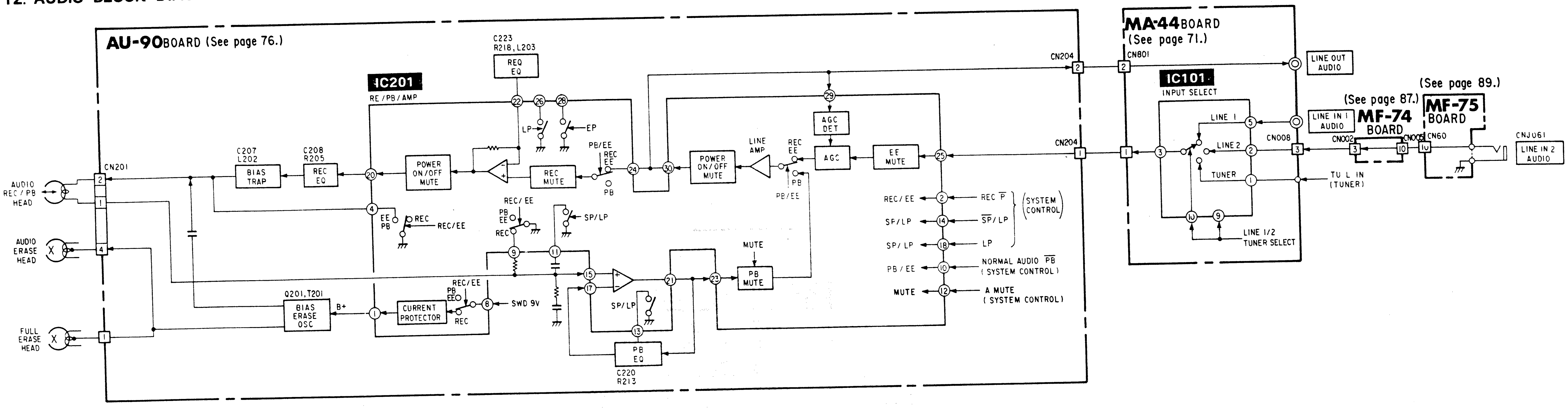
Signal Name	Pin No.	I/O	STOP/ FF/REW	TAPE LOADING	TAPE UNLOADING	PB	PB• PAUSE	SLOW	×2	CUE	REVIEW	REC	REC PAUSE	–×1	–×2
NA•PB	MA-44 BOARD IC501 ⑦	O	L	L	L	H	H	H	H	H	H	L	L		
A MUTE	MA-44 BOARD IC501 (76)	O	L	L	L	*1	H	H	H	H	H	L	L	H	H
$\overline{\text{SP}}$	MA-44 BOARD IC501 (77)	O	*2	*2	*2	*3	*3	*3	*3	*3	*3	*2	*2	L	*3
REC/$\overline{\text{P}}$	MA-44 BOARD IC501 (79)	O	L	L	L	L	L	L	L	L	L	H	L	H	L

*1. "H" when CTL signal is not played back.

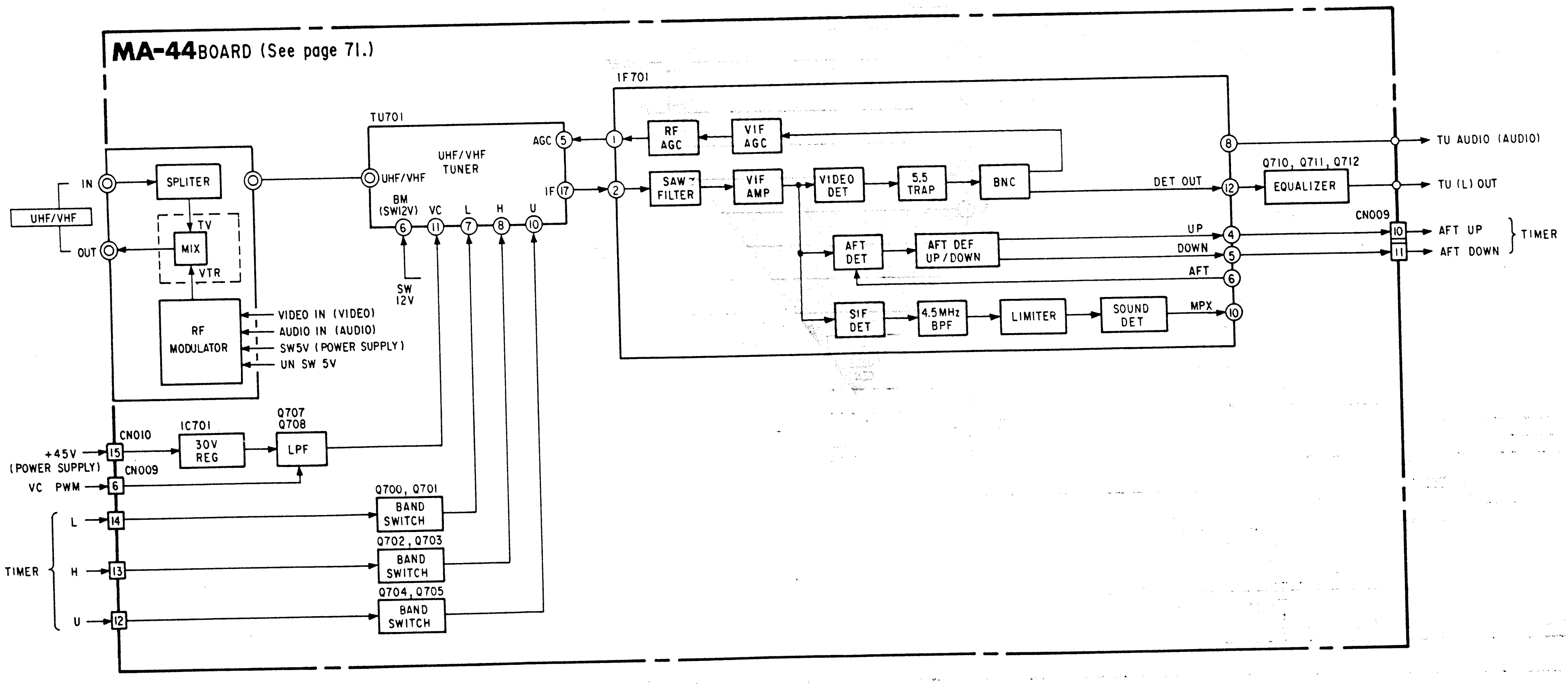
*2. By SP/LP selector, "L" during SP mode, or "H" during LP mode.

*3. By the mode on the recorded tape, "L" when it is SP mode, or "H" when "LP" mode.

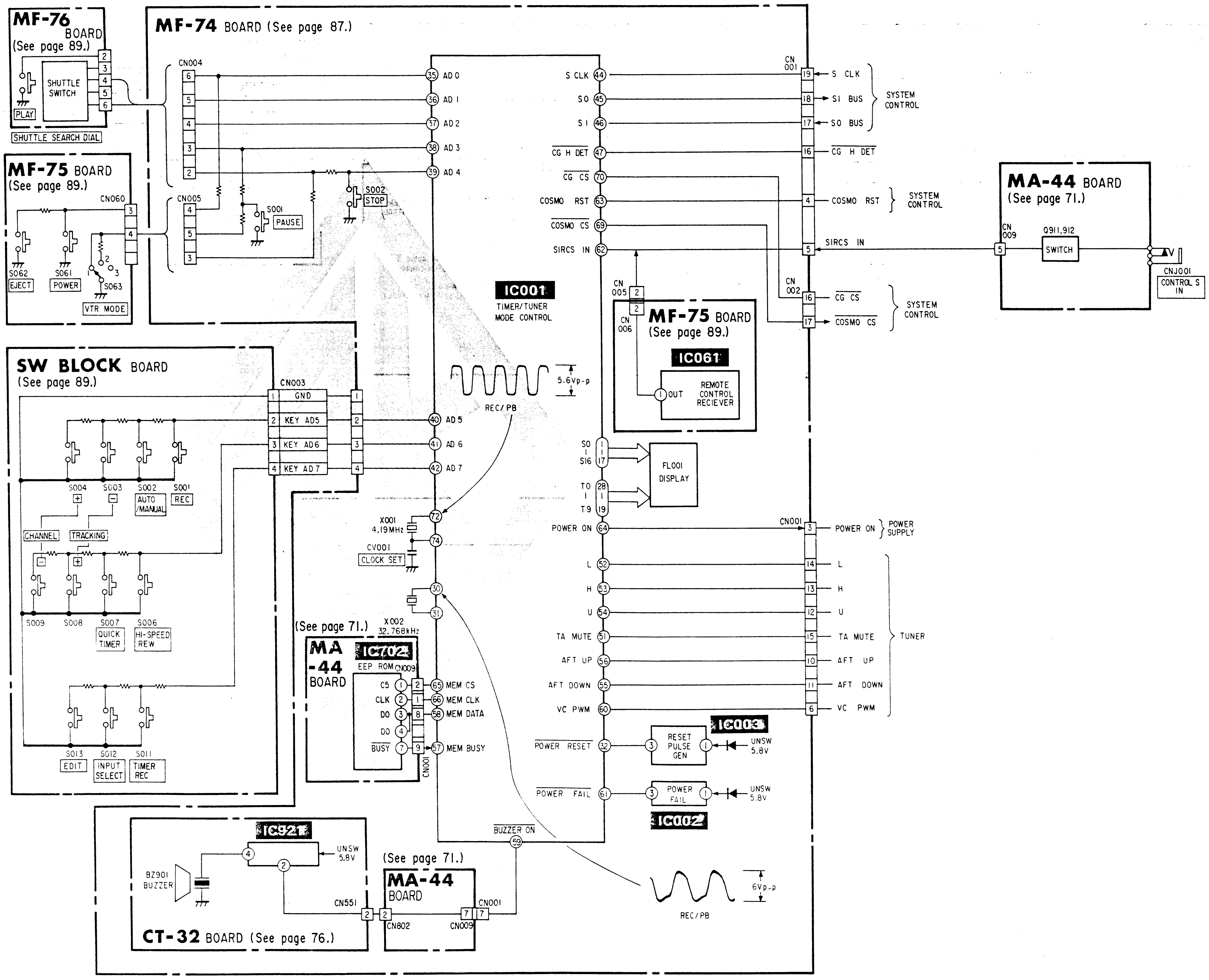
3-12. AUDIO BLOCK DIAGRAM


AU-90 BOARD (See page 76.)
IC201
RE/PB/AMP
C223
R218, L203
REQ EQ
CN201
AUDIO REC/PB HEAD
AUDIO ERASE HEAD
FULL ERASE HEAD
C207 L202
BIAS TRAP
C208 R205
REC EQ
POWER ON/OFF MUTE
REC MUTE
LP
EP
PB/EE
REC EE
PB
REC/EE
SP/LP
EE PB
REC
Q201, T201
BIAS ERASE OSC
B+
CURRENT PROTECTOR
SWD 9V
C220 R213
PB EQ
MUTE
PB MUTE
LINE AMP
AGC DET
AGC
EE MUTE
CN204
REC/EE
SP/LP
PB/EE
NORMAL AUDIO PB (SYSTEM CONTROL)
A MUTE (SYSTEM CONTROL)
SYSTEM CONTROL
MA-44 BOARD (See page 71.)
CN801
IC101
INPUT SELECT
LINE 1
LINE 2
TUNER
LINE 1/2 TUNER SELECT
CN008
LINE OUT AUDIO
LINE IN 1 AUDIO
TU L IN (TUNER)
(See page 87.)
MF-74 BOARD
CN002
CN005
(See page 89.)
MF-75 BOARD
CN60
CNJ061
LINE IN 2 AUDIO

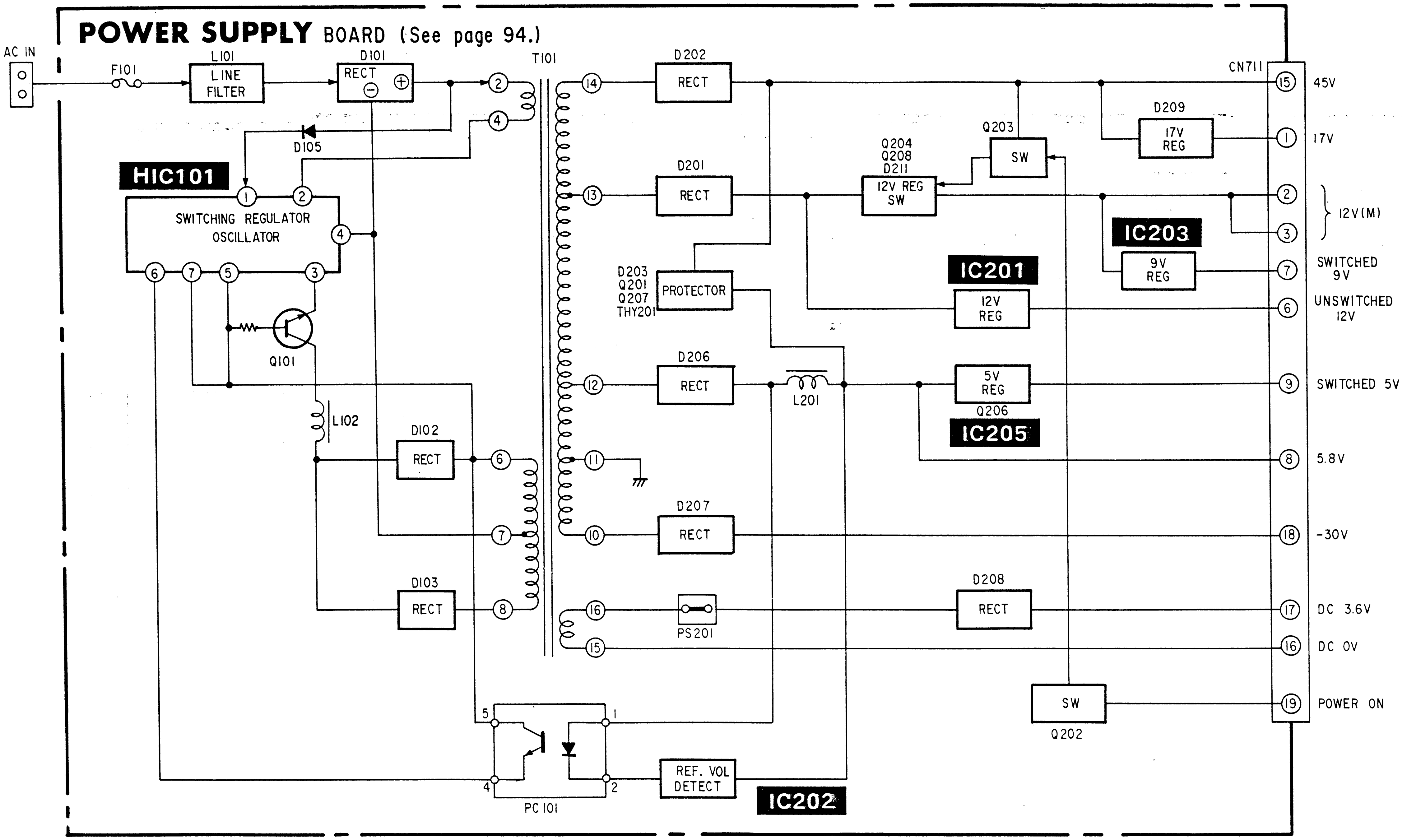
3-13. TUNER BLOCK DIAGRAM


MA-44 BOARD (See page 71.)
UHF/VHF
IN
OUT
SPLITER
TV
MIX
VTR
RF MODULATOR
VIDEO IN (VIDEO)
AUDIO IN (AUDIO)
SW5V (POWER SUPPLY)
UN SW 5V
TU701
UHF/VHF TUNER
AGC
IF
BM (SW12V)
VC
L
H
U
SW 12V
IF701
RF AGC
VIF AGC
SAW FILTER
VIF AMP
VIDEO DET
5.5 TRAP
BNC
DET OUT
AFT DET
AFT DEF UP/DOWN
UP
DOWN
AFT
SIF DET
4.5MHz BPF
LIMITER
SOUND DET
MPX
Q710, Q711, Q712
EQUALIZER
CN009
TU AUDIO (AUDIO)
TU (L) OUT
AFT UP
AFT DOWN
TIMER
CN010
IC701
30V REG
Q707 Q708
LPF
+45V (POWER SUPPLY)
VC PWM
Q700, Q701
BAND SWITCH
Q702, Q703
BAND SWITCH
Q704, Q705
BAND SWITCH
TIMER
L
H
U

3-14. TIMER AND MODE CONTROL BLOCK DIAGRAM


MF-76 BOARD (See page 89.)
SHUTTLE SWITCH
PLAY
SHUTTLE SEARCH DIAL
MF-74 BOARD (See page 87.)
CN004
CN005
S001 PAUSE
S002 STOP
AD 0
AD 1
AD 2
AD 3
AD 4
S CLK
SO
SI
CG H DET
CG CS
COSMO RST
COSMO CS
SIRCS IN
CN 001
S CLK
SI BUS
SO BUS
SYSTEM CONTROL
CG H DET
COSMO RST
SYSTEM CONTROL
SIRCS IN
CN 002
CG CS
COSMO CS
SYSTEM CONTROL
MF-75 BOARD (See page 89.)
CN060
S062 EJECT
S061 POWER
S063 VTR MODE
IC001 TIMER/TUNER MODE CONTROL
CN 005
CN 006
MF-75 BOARD (See page 89.)
IC061
OUT
REMOTE CONTROL RECIEVER
MA-44 BOARD (See page 71.)
CN 009
Q911,912
SWITCH
CNJ001
CONTROL S IN
SW BLOCK BOARD (See page 89.)
CN003
GND
KEY AD5
KEY AD6
KEY AD7
AD 5
AD 6
AD 7
5.6Vp-p
REC/PB
S004 +
S003 −
S002 AUTO/MANUAL
S001 REC
CHANNEL
TRACKING
S009
S008
S007 QUICK TIMER
S006 HI-SPEED REW
S013 EDIT
S012 INPUT SELECT
S011 TIMER REC
SO I S16
T0 I T9
FL001 DISPLAY
X001 4.19MHz
CV001 CLOCK SET
POWER ON
CN001
POWER ON
POWER SUPPLY
L
H
U
TA MUTE
AFT UP
AFT DOWN
VC PWM
TUNER
(See page 71.)
X002 32.768kHz
MA-44 BOARD
IC702
EEP ROM
CN009
CS
CLK
DO
DO
BUSY
MEM CS
MEM CLK
MEM DATA
MEM BUSY
CN001
POWER RESET
RESET PULSE GEN
IC003
UNSW 5.8V
POWER FAIL
POWER FAIL
IC002
UNSW 5.8V
BUZZER ON
IC921
UNSW 5.8V
BZ901 BUZZER
CN551
CT-32 BOARD (See page 76.)
(See page 71.)
MA-44 BOARD
CN802
CN009
CN001
6Vp-p
REC/PB

3-15. POWER SUPPLY BLOCK DIAGRAM


POWER SUPPLY BOARD (See page 94.)
AC IN
F101
L101
LINE FILTER
D101
RECT
⊕
⊖
T101
D105
HIC101
SWITCHING REGULATOR OSCILLATOR
Q101
L102
D102
RECT
D103
RECT
PC 101
D202
RECT
D201
RECT
D203
Q201
Q207
THY201
PROTECTOR
D206
RECT
L201
D207
RECT
PS201
REF. VOL DETECT
IC202
Q204
Q208
D211
12V REG SW
Q203
SW
D209
17V REG
IC203
9V REG
IC201
12V REG
5V REG
Q206
IC205
D208
RECT
SW
Q202
CN711
45V
17V
12V(M)
SWITCHED 9V
UNSWITCHED 12V
SWITCHED 5V
5.8V
-30V
DC 3.6V
DC 0V
POWER ON

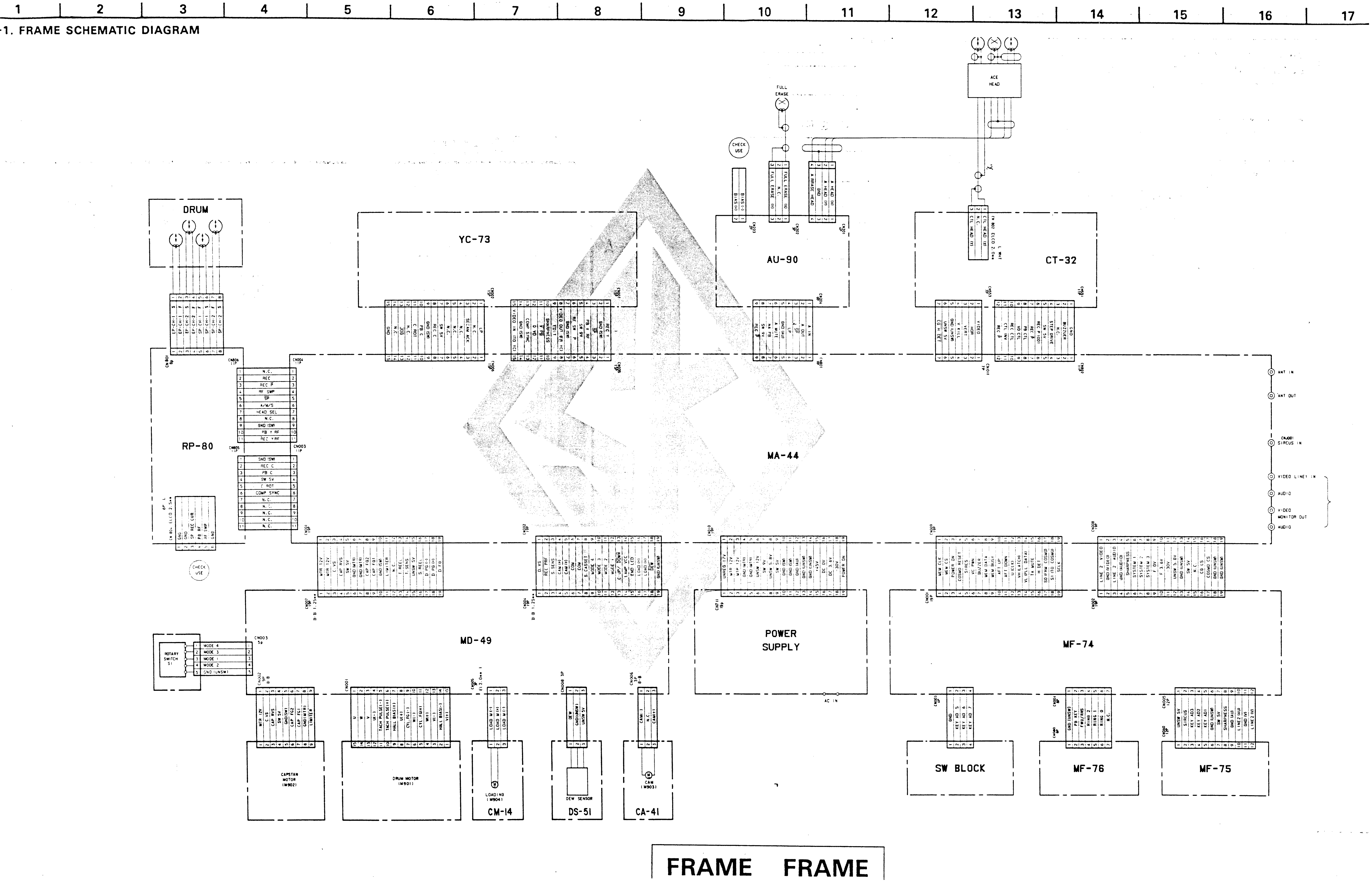
1 2

4-1. FRAME SCHEMATI

A
B
C
D
E
F
G
H
I
J

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

-1. FRAME SCHEMATIC DIAGRAM


1
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13
14
15
16
17
DRUM
RP-80
YC-73
AU-90
CT-32
MA-44
MD-49
POWER SUPPLY
MF-74
FULL ERASE
ACE HEAD
CHECK USE
ROTARY SWITCH S1
CAPSTAN MOTOR (M902)
DRUM MOTOR (M901)
LOADING (M904)
CM-14
DEW SENSOR
DS-51
CAM (M903)
CA-41
SW BLOCK
MF-76
MF-75
AC IN
ANT IN
ANT OUT
SIRCUS IN
VIDEO LINE1 IN
AUDIO
VIDEO MONITOR OUT
AUDIO
MODE 4
MODE 3
MODE 1
MODE 2
GND (UNSW)
FRAME FRAME

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAM

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

For printed wiring boards:

- ○— : indicates a lead wire mounted on the component side.

For schematic diagram:

- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W (Chip resistors: 1/10W) unless otherwise noted.
  kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF: μμF
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- ☐ : panel designation.
- △ : internal component.
- ☐ : adjustment for repair. *
- ━━━ : B+ line. *
- ━ ━ ━ : B− line. *
- Voltages are dc between measurement points and ground unless otherwise noted.
- Readings are taken with a color-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.
- ⇨ : IN/OUT direction of B line (+, −).
- Circled numbers refer to waveforms.

*** : indicated by the color red.**

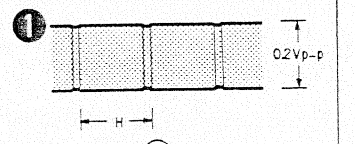
When indicating parts by reference number, please include the board name.

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

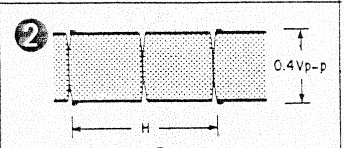
RP − 80 BOARD

CN801	A-8
CN804	A-5
CN805	B-2
CN806	B-2
D806	A-4
D808	B-6
D809	B-3
IC802	A-7
Q805	B-6
Q809	A-4
Q811	A-3
Q812	B-4
Q813	B-5
Q814	B-6

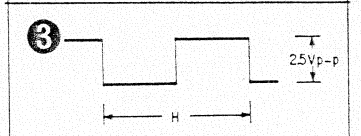
RP-80 BOARD



IC802 ⑱ REC



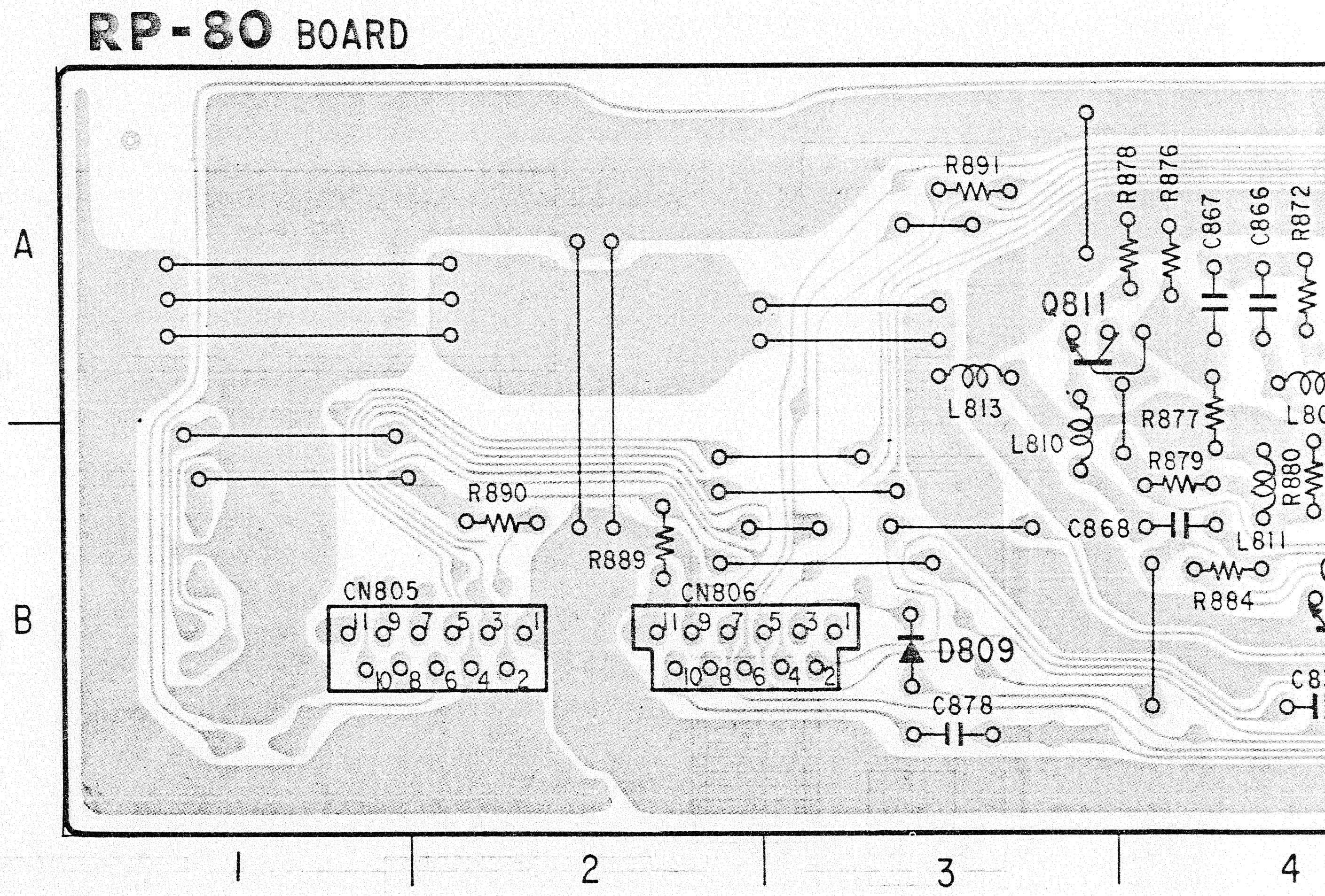
IC802 ⑲ PB



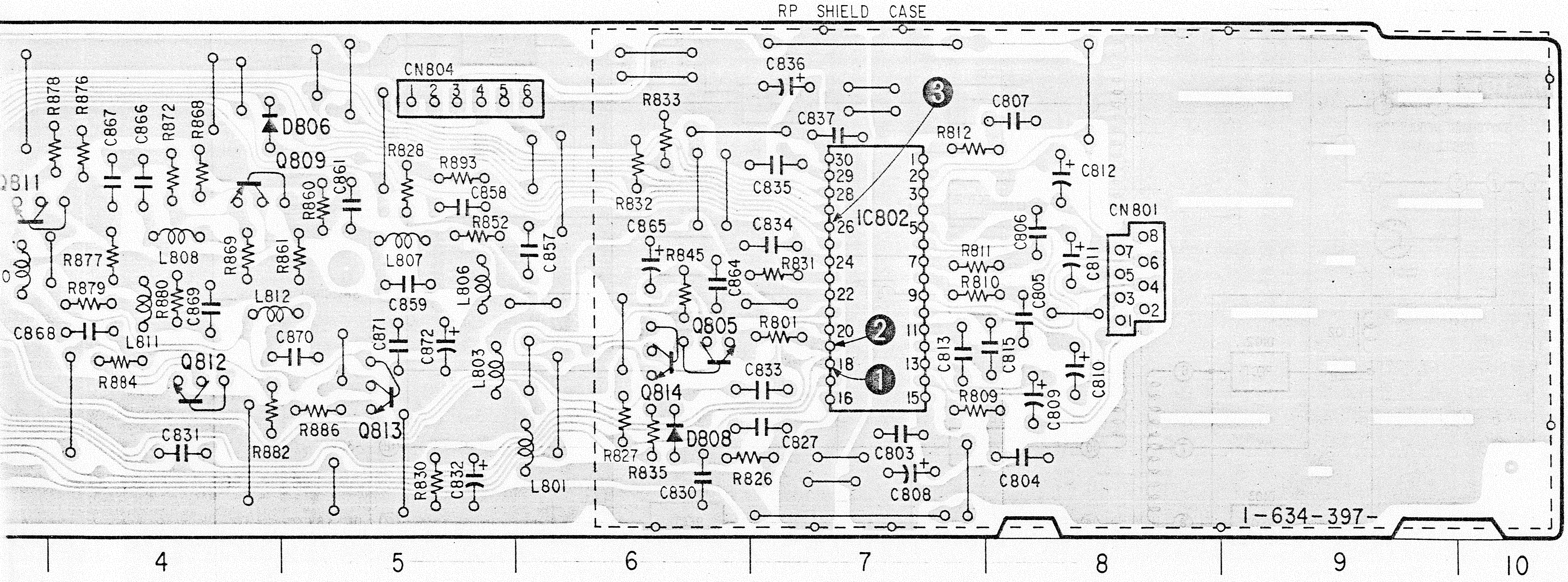
IC802 ㉖ PB(SWP)

RP-80 (REC/PB AMP) PRINTED WIRING BOARD

− Ref. No. : RP-80 Board ; 1,000 series −



REC/PB AMP REC/PB AMP


RP SHIELD CASE
CN804
1 2 3 4 5 6
R878
R876
C867
C866
R872
R868
D806
Q809
Q811
C861
R828
R893
C858
R852
C857
R860
R877
L808
R869
R861
L807
C859
L806
R879
R880
C869
L812
C868
L811
C870
C871
C872
L803
R884
Q812
Q813
C831
R882
R886
R830
C832
L801
R833
C836
C837
C807
R812
C812
R832
C835
C865
C834
R845
C864
R831
IC802
R801
Q805
Q814
C833
D808
R827
R835
C830
R826
C827
C803
C808
C804
R811
R810
C806
C811
C805
C813
C815
R809
C809
C810
CN801
1-634-397-
4
5
6
7
8
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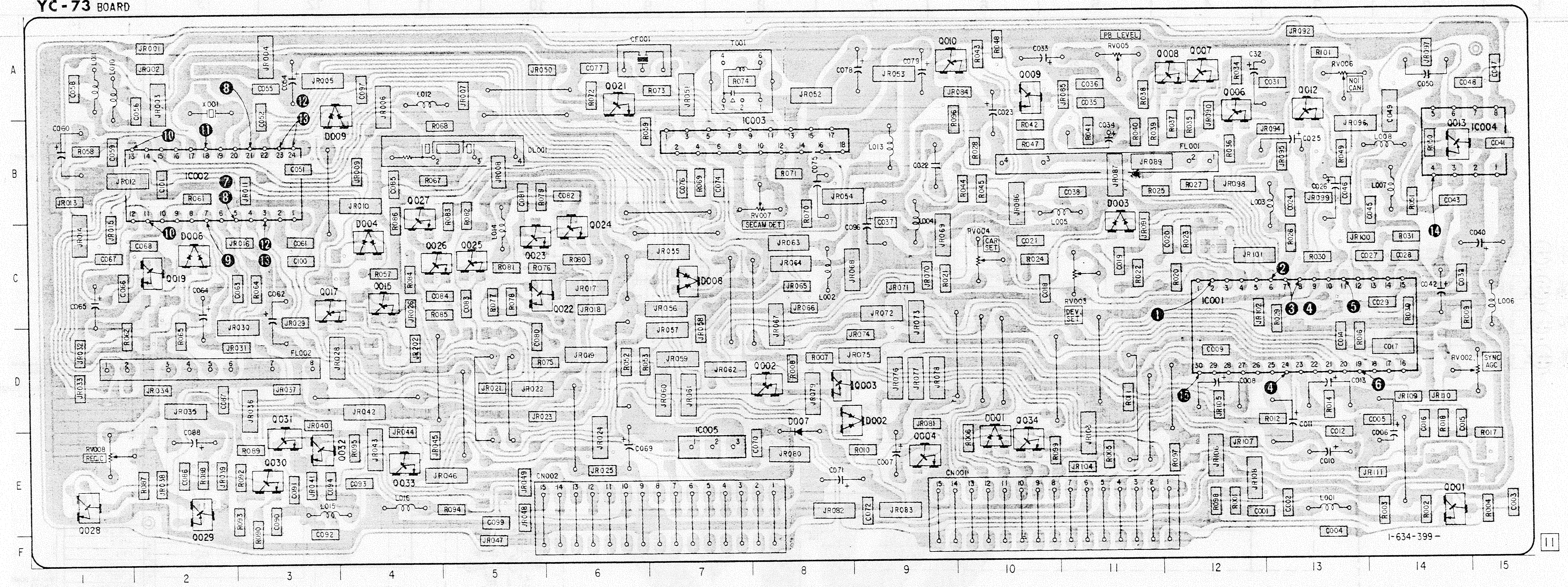
10

REC/PB AMP REC/PB AMP

YC-73 (VIDEO SIGNAL PROCESS) PRINTED WIRING BOARD

– Ref. No. : YC-73 Board ; 2,000 series –


YC-73 BOARD
A
B
C
D
E
F
1
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7
8
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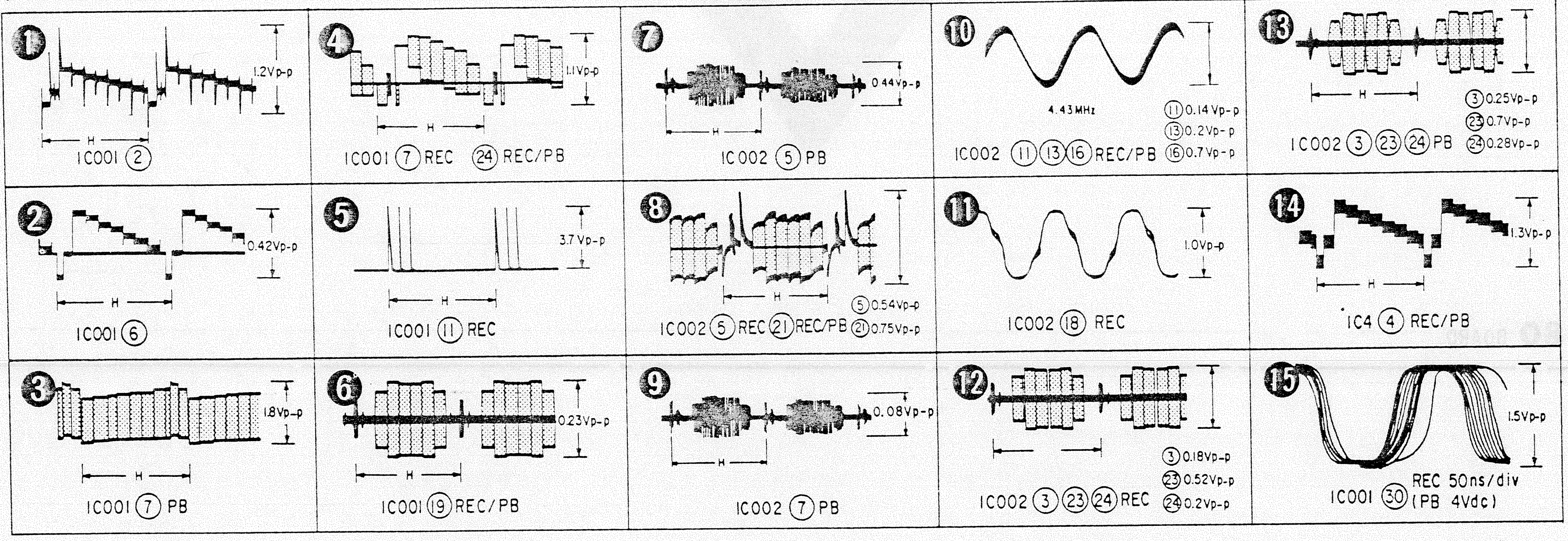
13
14
15
IC001
IC002
IC003
IC004
IC005
CN001
CN002
PB LEVEL
SECAM DET
CAR SET
DEV SET
SYNC AGC
NOI CAN
REC C
1-634-399-
11

YC – 73 BOARD

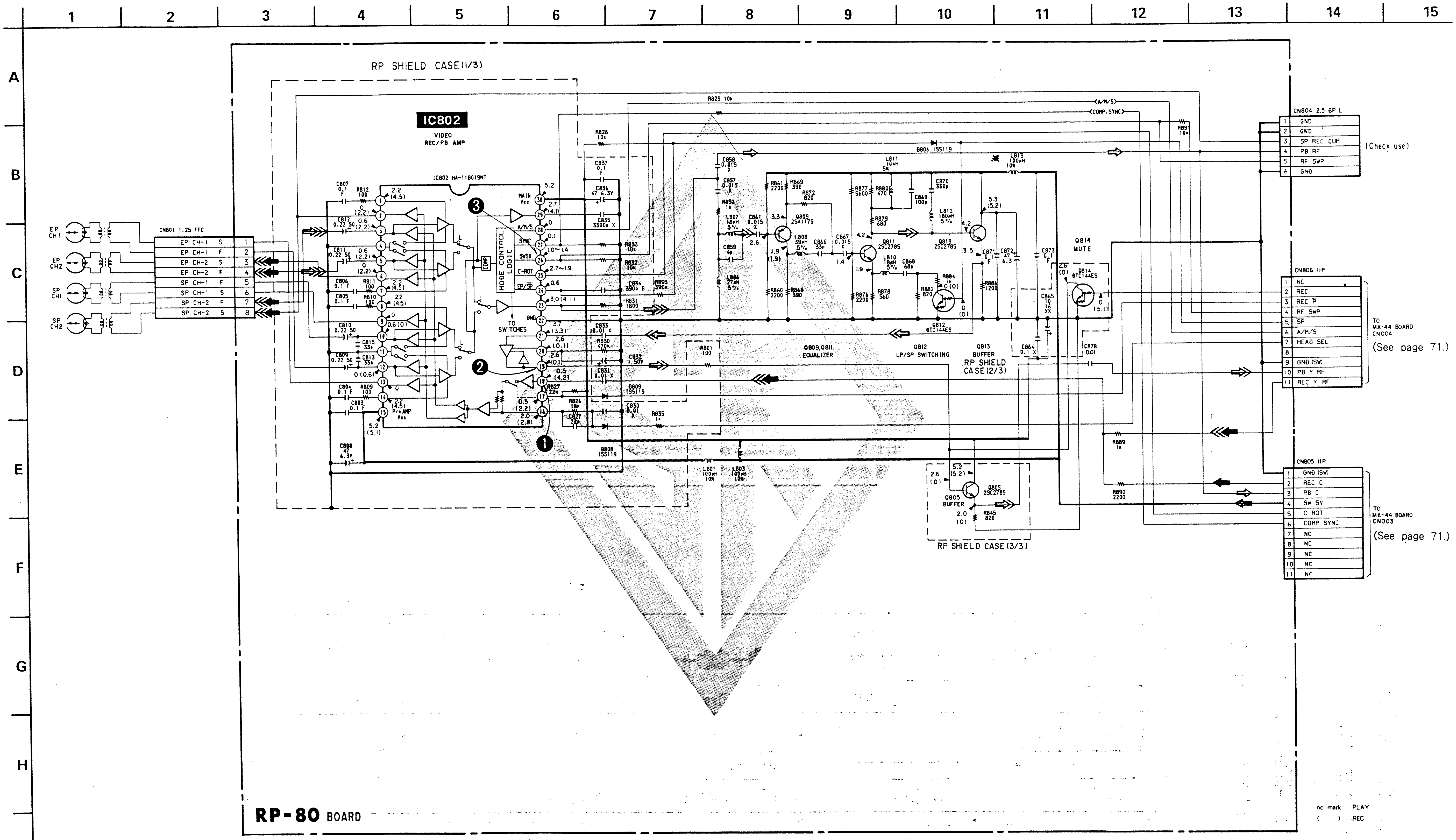
CN001	E-10	Q012	A-13
CN002	E-6	Q013	B-14
		Q015	C-4
D001	E-10	Q017	C-3
D002	E-9	Q019	C-2
D003	C-11	Q021	A-6
D004	C-4	Q022	C-6
D006	D-2	Q023	C-5
D007	E-8	Q024	C-6
D008	C-7	Q025	C-5
D009	B-4	Q026	C-4
		Q027	C-4
IC001	D-13	Q028	E-1
IC002	B-2	Q029	E-2
IC003	B-8	Q030	E-3
IC004	B-15	Q031	E-3
IC005	E-7	Q032	E-3
		Q033	E-4
Q001	E-14	Q034	E-10
Q002	D-8		
Q003	D-8	RV002	D-15
Q004	E-9	RV003	C-11
Q006	A-12	RV004	C-10
Q007	A-12	RV005	A-11
Q008	A-12	RV006	A-13
Q009	A-10	RV007	B-8
Q010	A-10	RV008	E-1

YC-73 BOARD



RP-80 (REC/PB AMP) SCHEMATIC DIAGRAM

– Ref. No.: RP-80 Board; 1,000 series –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14
15
A
B
C
D
E
F
G
H
I
J
RP SHIELD CASE(1/3)
IC802
VIDEO
REC/PB AMP
IC802 HA-118019NT
MODE CONTROL LOGIC
MAIN Vcc
A/M/S
SYNC
SW30
C-ROT
EP/SP
GND
TO SWITCHES
Pre AMP Vcc
EP CH1
EP CH2
SP CH1
SP CH2
CN801 1.25 FFC
EP CH-1 S
EP CH-1 F
EP CH-2 S
EP CH-2 F
SP CH-1 F
SP CH-1 S
SP CH-2 F
SP CH-2 S
R829 10k
A/M/S
COMP.SYNC
Q806 1SS119
L811 10μH 5%
L813 100μH 10%
Q809 2SA1175
Q811 2SC2785
Q813 2SC2785
Q814 MUTE
Q814 DTC144ES
Q812 DTC144ES
Q809,Q811 EQUALIZER
Q812 LP/SP SWITCHING
Q813 BUFFER
RP SHIELD CASE(2/3)
Q805 BUFFER
Q805 2SC2785
RP SHIELD CASE(3/3)
L801 100μH 10%
L803 100μH 10%
D808 1SS119
D809 1SS119
CN804 2.5 6P L
1 GND
2 GND
3 SP REC CUR
4 PB RF
5 RF SWP
6 GND
(Check use)
CN806 11P
1 NC
2 REC
3 REC P
4 RF SWP
5 SP
6 A/M/S
7 HEAD SEL
8
9 GND (SW)
10 PB Y RF
11 REC Y RF
TO MA-44 BOARD CN004
(See page 71.)
CN805 11P
1 GND (SW)
2 REC C
3 PB C
4 SW 5V
5 C ROT
6 COMP SYNC
7 NC
8 NC
9 NC
10 NC
11 NC
TO MA-44 BOARD CN003
(See page 71.)
RP-80 BOARD

no mark : PLAY
( ) : REC

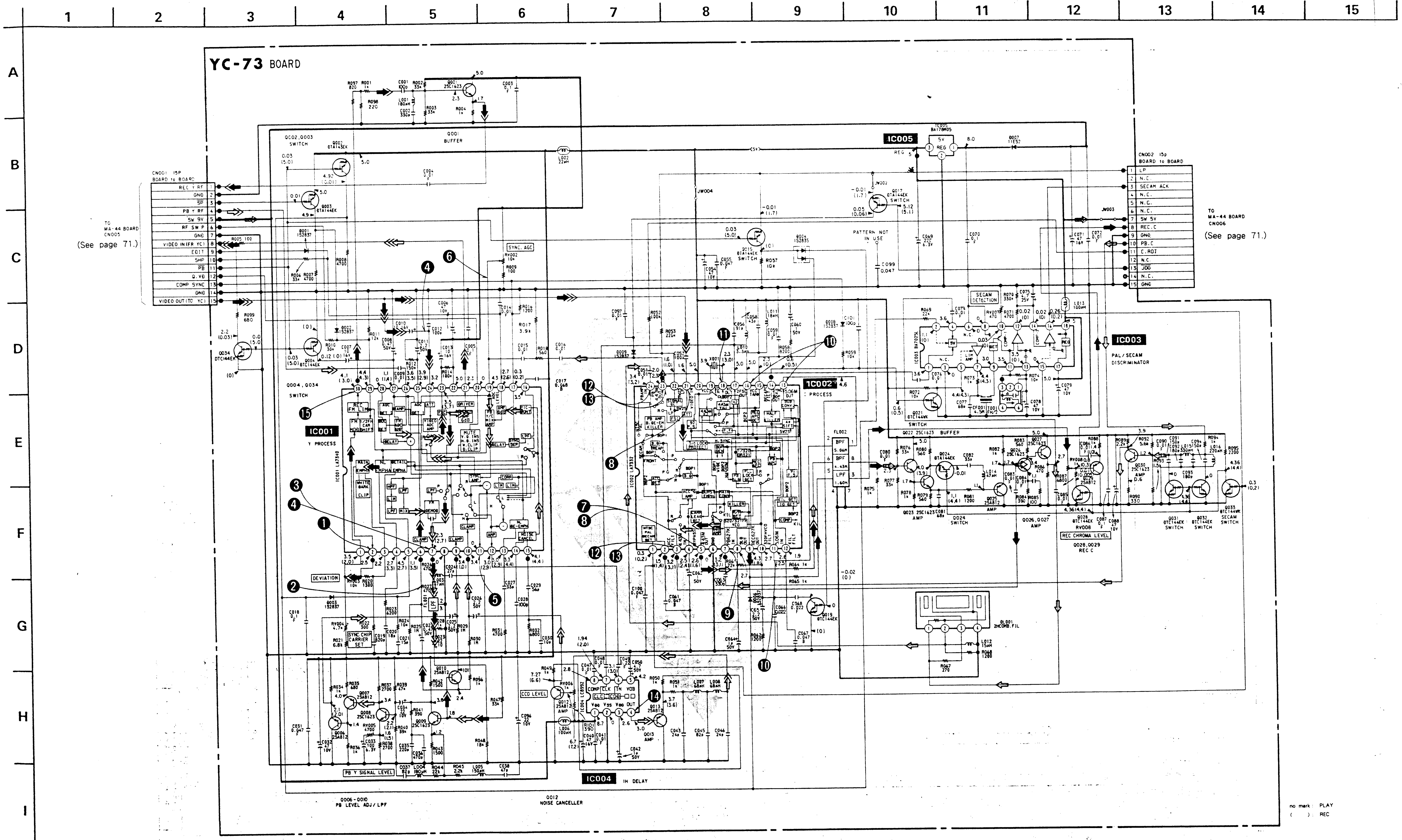
- Signal path

	CHROMA	Y	Y/CHROMA
REC	➡	⇛	⇛
PB	⇨	⇨	⇨

REC/PB AMP REC/PB AMP

YC-73 (VIDEO SIGNAL PROCESS) SHCEMATIC DIAGRAM

– Ref. No.: YC-73 Board; 2,000 series –


YC-73 BOARD
CN001 15P BOARD to BOARD
REC Y RF
GND
SP
PB Y RF
SW 9V
RF SW P
GND
VIDEO IN(FR YC)
EDIT
SHP
PB
Q.VD
COMP SYNC
GND
VIDEO OUT(TO YC)
TO MA-44 BOARD CN005
(See page 71.)
IC001 Y PROCESS
IC002 PROCESS
IC003 PAL/SECAM DISCRIMINATOR
IC004 1H DELAY
IC005 BA178M05
CN002 15p BOARD to BOARD
1 LP
2 N.C
3 SECAM ACK
4 N.C.
5 N.C.
6 N.C.
7 SW 5V
8 REC.C
9 GND
10 PB.C
11 C.ROT
12 N.C
13 JOG
14 N.C.
15 GND
TO MA-44 BOARD CN006
(See page 71.)
Q001 BUFFER
Q002,Q003 SWITCH
Q004,Q034 SWITCH
Q006-Q010 PB LEVEL ADJ/LPF
Q012 NOISE CANCELLER
Q013 AMP
Q015 SWITCH
Q017 SWITCH
Q019
Q021 SWITCH
Q022 2SC1623 BUFFER
Q023 2SC1623 AMP
Q024 SWITCH
Q025 AMP
Q026,Q027 AMP
Q028,Q029 REC C
Q030 AMP
Q031 SWITCH
Q032 SWITCH
Q033 SECAM SWITCH
FL001
FL002
BL001 2HCOMB.FIL
PATTERN NOT IN USE
SYNC. AGC
DEVIATION
SYNC CHIP CARRIER SET
PB Y SIGNAL LEVEL
CCD LEVEL
REC CHROMA LEVEL
SECAM DETECTION
no mark : PLAY
( ) : REC

- Signal path

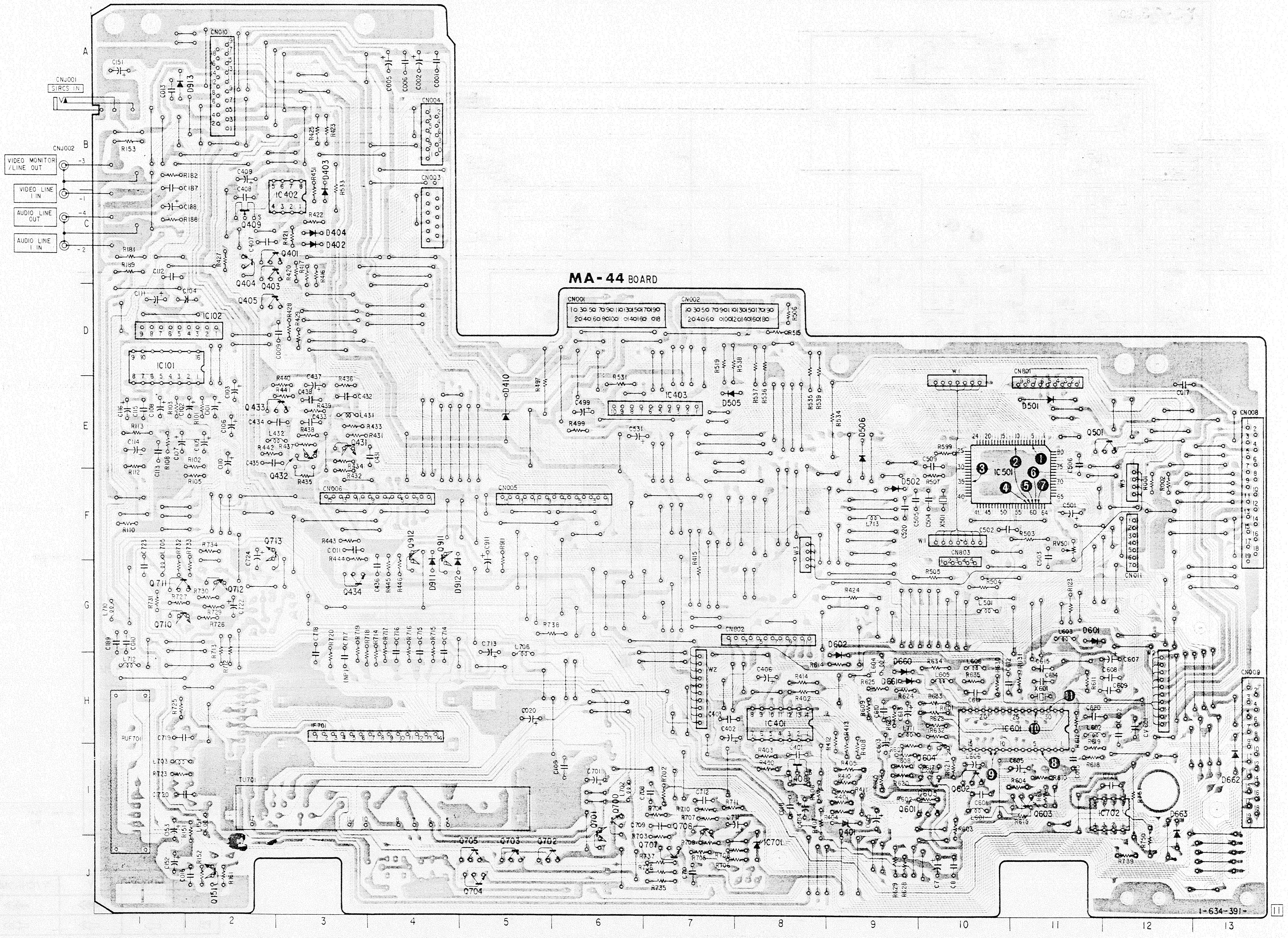
	CHROMA	Y	Y/CHROMA
REC	➡	➡➡	➡➡➡
PB	⇨	⇨⇨	⇨⇨⇨

MA-44 (SERVO, SYSTEM CONTROL, TUNER) PRINTED WIRING BOARD

– Ref. No. : MA-44 Board ; 3,000 series –

MA-44 BOARD

CN001	D-6
CN002	D-7
CN003	C-4
CN004	B-4
CN005	F-6
CN006	F-4
CN008	F-13
CN009	I-13
CN010	A-2
CN011	F-12
CN801	E-11
CN802	G-8
CN803	G-10
D401	J-9
D402	C-3
D403	C-3
D404	C-3
D410	E-5
D501	E-11
D502	F-9
D505	E-7
D506	F-9
D601	G-11
D602	H-9
D660	H-9
D661	H-9
D662	I-13
D663	J-12
D911	G-4
D912	G-4
D913	B-1
IC101	E-1
IC102	D-1
IC401	H-8
IC402	C-3
IC403	E-7
IC501	F-11
IC601	H-11
IC701	J-8
IC702	I-12
Q151	J-2
Q401	C-2
Q403	D-2
Q404	C-2
Q405	D-2
Q408	I-8
Q409	C-2
Q431	E-3
Q432	F-3
Q433	E-3
Q434	G-3
Q501	E-12
Q601	I-10
Q602	I-10
Q603	I-11
Q604	I-10
Q605	I-10
Q700	I-6
Q701	I-6
Q702	J-5
Q703	J-5
Q704	J-5
Q705	J-5
Q707	J-7
Q708	J-7
Q710	G-1
Q711	G-1
Q712	G-2
Q713	G-2
Q911	G-4
Q912	G-4
RV501	F-11


MA-44 BOARD
CNJ001
SIRCS IN
CNJ002
VIDEO MONITOR /LINE OUT
VIDEO LINE 1 IN
AUDIO LINE OUT
AUDIO LINE 1 IN
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
9
10
11
12
13
CN001
CN002
CN003
CN004
CN005
CN006
CN008
CN009
CN010
CN011
CN801
CN802
CN803
IC101
IC102
IC401
IC402
IC403
IC501
IC601
IC701
IC702
TU701
RV501
1-634-391-
11

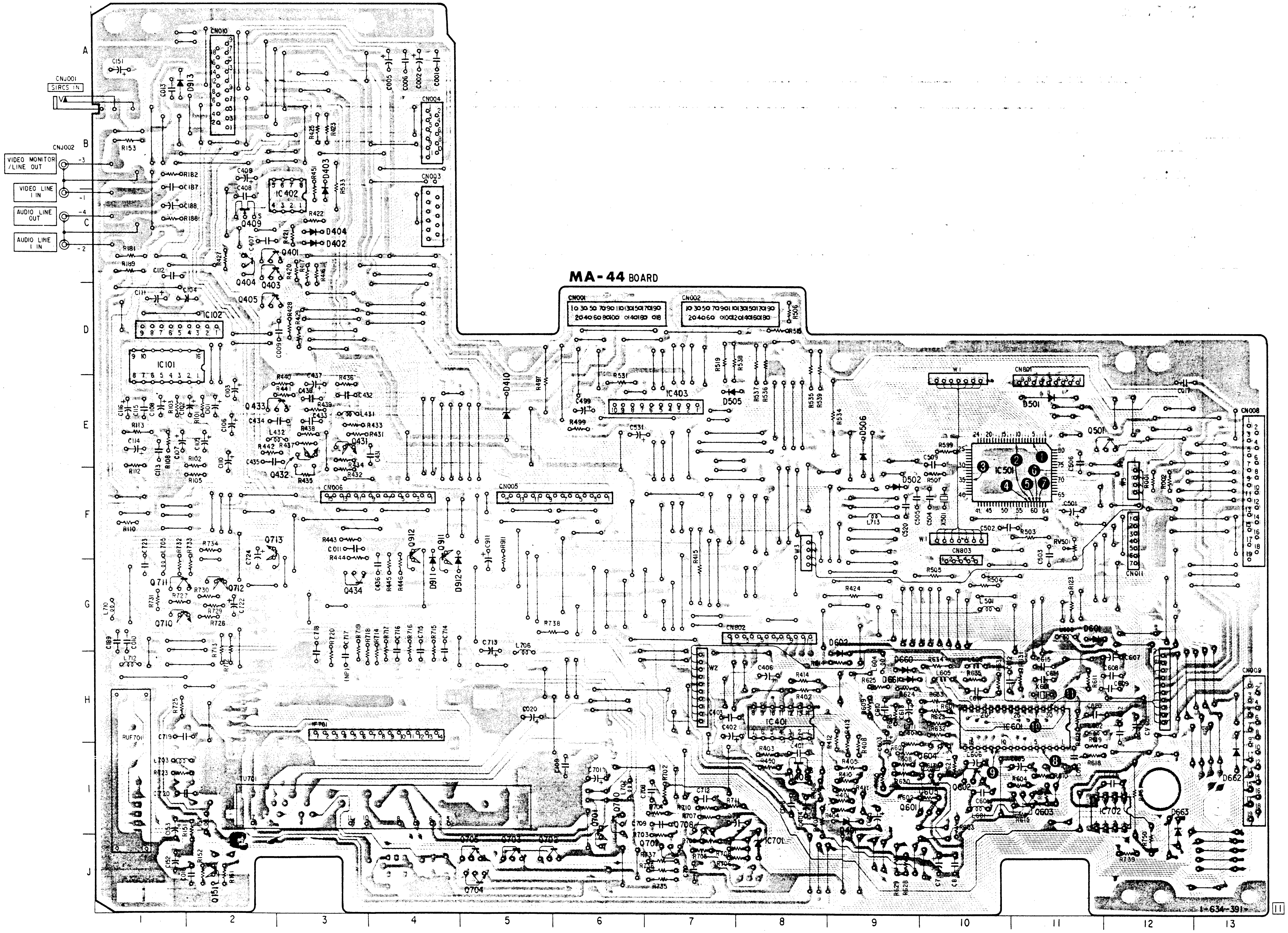
SERVO, SYSTEM CONTROL, TUNER

SERVO, SYSTEM CONTROL, TUNER

MA-44 (SERVO, SYSTEM CONTROL, TUNER) PRINTED WIRING BOARD

– Ref. No. : MA-44 Board ; 3,000 series –

MA-44 BOARD	
CN001	D-6
CN002	D-7
CN003	C-4
CN004	B-4
CN005	F-6
CN006	F-4
CN008	F-13
CN009	I-13
CN010	A-2
CN011	F-12
CN801	E-11
CN802	G-8
CN803	G-10
D401	J-9
D402	C-3
D403	C-3
D404	C-3
D410	E-5
D501	E-11
D502	F-9
D505	E-7
D506	F-9
D601	G-11
D602	H-9
D660	H-9
D661	H-9
D662	I-13
D663	J-12
D911	G-4
D912	G-4
D913	B-1
IC101	E-1
IC102	D-1
IC401	H-8
IC402	C-3
IC403	E-7
IC501	F-11
IC601	H-11
IC701	J-8
IC702	I-12
Q151	J-2
Q401	C-2
Q403	D-2
Q404	C-2
Q405	D-2
Q408	I-8
Q409	C-2
Q431	E-3
Q432	F-3
Q433	E-3
Q434	G-3
Q501	E-12
Q601	I-10
Q602	I-10
Q603	I-11
Q604	I-10
Q605	I-10
Q700	I-6
Q701	I-6
Q702	J-5
Q703	J-5
Q704	J-5
Q705	J-5
Q707	J-7
Q708	J-7
Q710	G-1
Q711	G-1
Q712	G-2
Q713	G-2
Q911	G-4
Q912	G-4
RV501	F-11


CNJ001
SIRCS IN
CNJ002
VIDEO MONITOR /LINE OUT
VIDEO LINE IN
AUDIO LINE OUT
AUDIO LINE IN
MA-44 BOARD
CN001
CN002
CN003
CN004
CN005
CN006
CN008
CN009
CN010
CN011
CN801
CN802
CN803
IC101
IC102
IC401
IC402
IC403
IC501
IC601
IC701
IC702
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
9
10
11
12
13
1-634-391-11

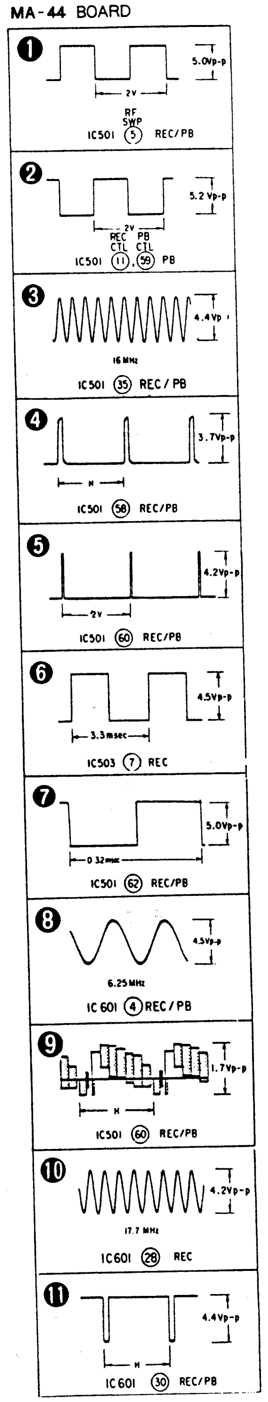
SERVO, SYSTEM CONTROL, TUNER

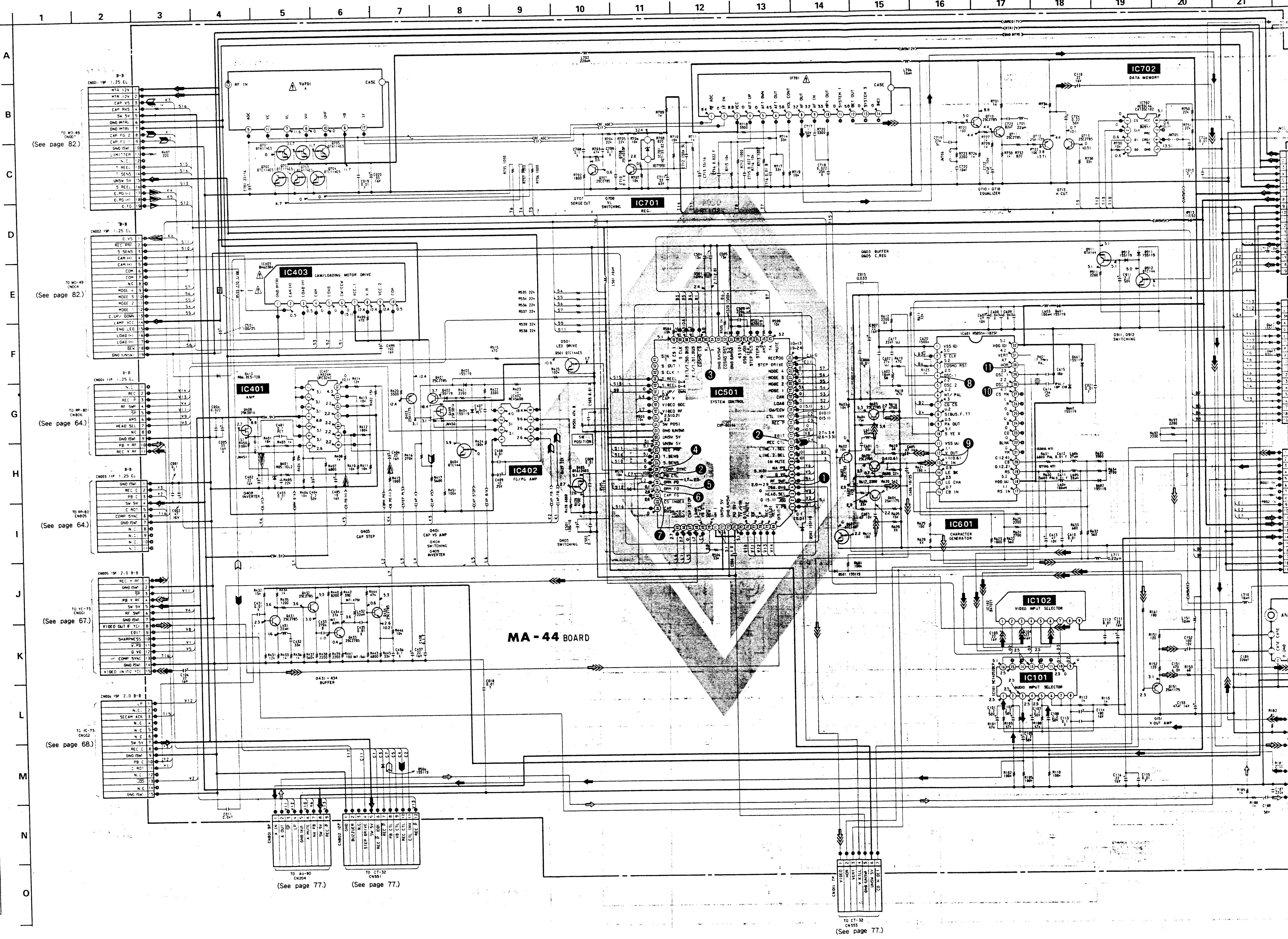
SERVO, SYSTEM CONTROL, TUNER

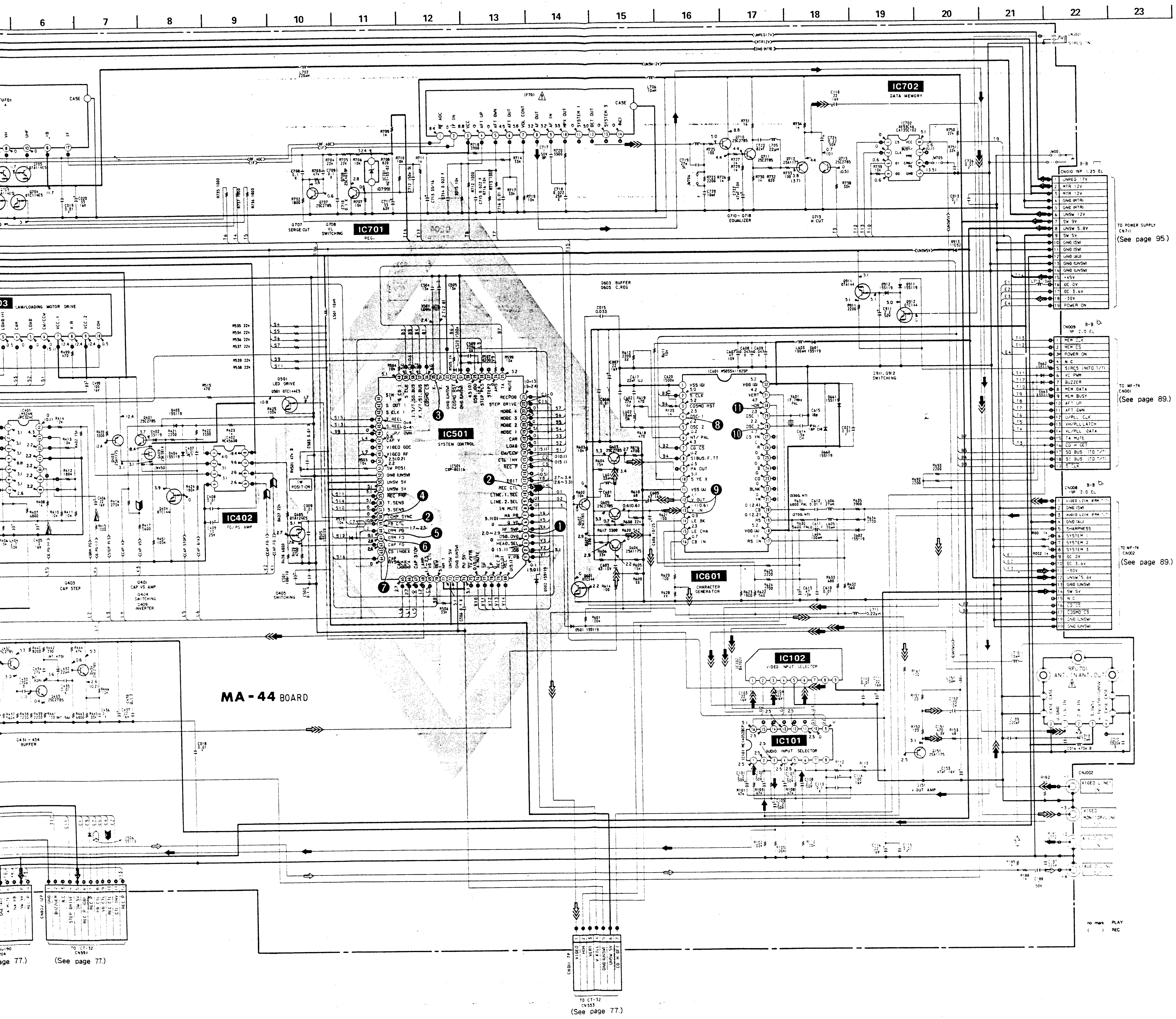
MA-44 (SERVO, SYSTEM CONTROL, TUNER) SCHEMATIC DIAGRAM

– Ref. No.: MA-44 Board: 3,000 series –

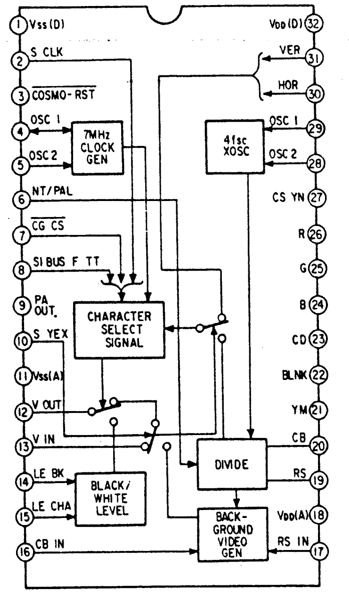
MA-44 BOARD




1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
CN001 19P 1.25 EL
TO MD-49 CN007 (See page 82.)
CN002 19P 1.25 EL
TO MD-49 CN004 (See page 82.)
CN004 11P 1.25 EL
TO RP-80 CN806 (See page 64.)
CN003 11P 1.25 EL
TO RP-80 CN805 (See page 64.)
CN005 15P 2.0 B-B
TO YC-73 CN001 (See page 67.)
CN006 15P 2.0 B-B
TO YC-73 CN002 (See page 68.)
TU701
IF701
IC701
REG.
IC702
DATA MEMORY
Q707 SERGE CUT
Q708 VL SWITCHING
Q710-Q718 EQUALIZER
Q713 H CUT
IC403
CAM/LOADING MOTOR DRIVE
IC401
AMP
IC402
FG/PG AMP
IC501
SYSTEM CONTROL
IC601
CHARACTER GENERATOR
Q603 BUFFER
Q605 C.REG
Q501 LED DRIVE
S501 SW POSITION
Q911, Q912 SWITCHING
Q403 CAP STEP
Q401 CAP VS AMP
Q404 SWITCHING
Q406 INVERTER
Q405 SWITCHING
Q408 INVERTER
Q431-434 BUFFER
MA-44 BOARD
IC102
VIDEO INPUT SELECTOR
IC101
AUDIO INPUT SELECTOR
Q151 V OUT AMP
CN801 9P
TO AU-90 CN204 (See page 77.)
CN802 12P
TO CT-32 CN551 (See page 77.)
CN001
TO CT-32 CN553 (See page 77.)


6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
IC701
REG.
IC702
DATA MEMORY
IC501
SYSTEM CONTROL
IC601
CHARACTER GENERATOR
IC402
FG/PG AMP
IC102
VIDEO INPUT SELECTOR
IC101
AUDIO INPUT SELECTOR
MA-44 BOARD
CN010 19P 1.25 EL
TO POWER SUPPLY CN711
(See page 95.)
CN009 B-B 19P 2.0 EL
TO MF-74 CN001
(See page 89.)
CN008 B-B 19P 2.0 EL
TO MF-74 CN002
(See page 89.)
RFU701 ANT IN ANT OUT
D707 SERGE CUT
D708 VTL SWITCHING
D710 - D718 EQUALIZER
D715 H CUT
D603 BUFFER
D605 C.REG
Q911, Q912 SWITCHING
Q403 CAP STEP
Q401 CAP VS AMP
Q404 SWITCHING
Q409 INVERTER
Q405 SWITCHING
Q431-434 BUFFER
D501 LED DRIVE
Q151 V OUT AMP
no mark PLAY
( ) REC
TO CT-32 CN551
(See page 77.)
TO CT-32 CN553
(See page 77.)
(See page 77.)

- IC601 M50554-1825P


Vss (D)
S CLK
COSMO-RST
OSC 1
OSC 2
7MHz CLOCK GEN
NT/PAL
CG CS
SI BUS F TT
PA OUT
S YEX
Vss(A)
V OUT
V IN
LE BK
LE CHA
CB IN
CHARACTER SELECT SIGNAL
BLACK/WHITE LEVEL
4fsc XOSC
DIVIDE
BACK-GROUND VIDEO GEN
Vdd (D)
VER
HOR
OSC 1
OSC 2
CS YN
R
G
B
CD
BLNK
YM
CB
RS
Vdd(A)
RS IN
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32

- Signal path

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡⋙	→
PB	⇨	⇨»	⇨⋙	

- Signal paths

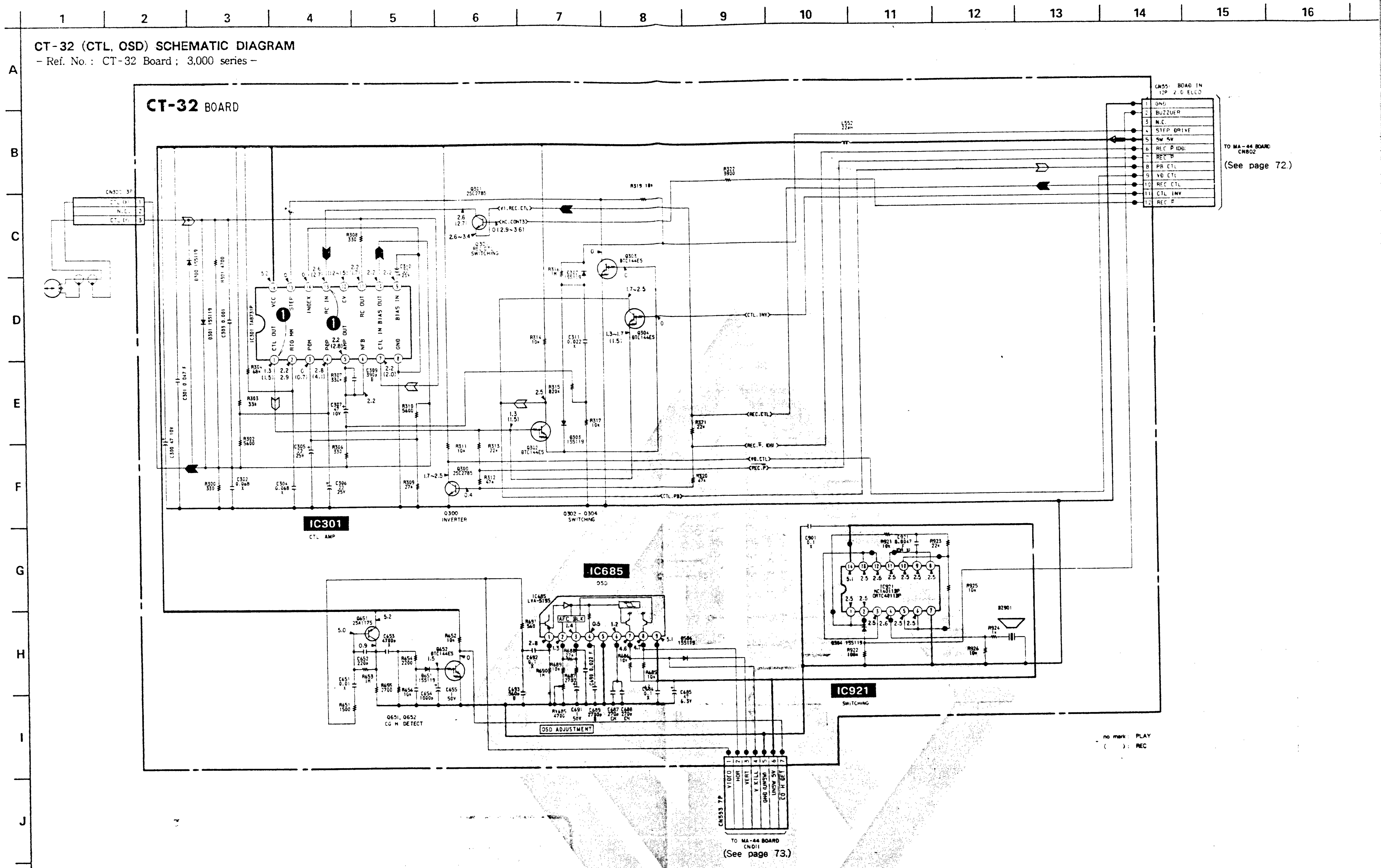
	SERVO (REC/PB)
Capstan speed servo	▷
Drum speed servo	▷
Drum phase servo	▷»
Drum (speed and phase)	▷⋙

- Signal paths

	CTL
REC	→
PB	

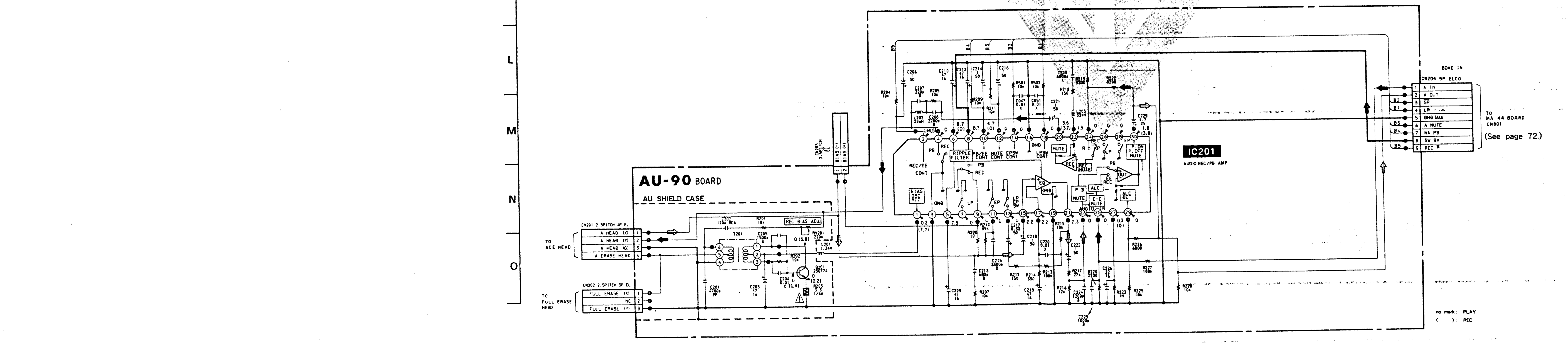
CT-32 (CTL, OSD) SCHEMATIC DIAGRAM

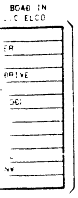
– Ref. No. : CT-32 Board ; 3,000 series –


CT-32 BOARD
IC301
CTL AMP
IC685
OSD
IC921
SWITCHING
Q300
INVERTER
Q302 - Q304
SWITCHING
Q651, Q652
CG H. DETECT
OSD ADJUSTMENT
GND
BUZZER
N.C.
STEP DRIVE
SW 5V
REC P
PB CTL
VD CTL
REC CTL
CTL INV
TO MA-44 BOARD CN802
(See page 72.)
TO MA-44 BOARD CN811
(See page 73.)
no mark : PLAY
( ) : REC

AU-90 (AUDIO) SHCEMATIC DIAGRAM

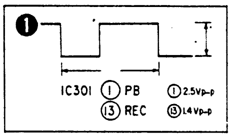
– Ref. No. : AU-90 Board ; 3,000 series –


AU-90 BOARD
AU SHIELD CASE
IC201
AUDIO REC/PB AMP
REC BIAS ADJ
TO ACE HEAD
A HEAD
A ERASE HEAD
TO FULL ERASE HEAD
FULL ERASE
A IN
A OUT
SP
LP
GND (AU)
A MUTE
NA PB
SW 9V
REC P
TO MA-44 BOARD CN801
(See page 72.)
no mark : PLAY
( ) : REC


BOAD IN
C ELCO
ER
DRIVE
OC
NV

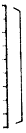
TO MA-44 BOARD CN802
(See page 72.)

CT-32 BOARD


❶
IC301 ① PB ⑬ REC
① 2.5Vp-p
⑬ 1.4Vp-p

- Signal paths

	CTL
REC	➧
PB	⊳



TO MA 44 BOARD CN801
(See page 72.)

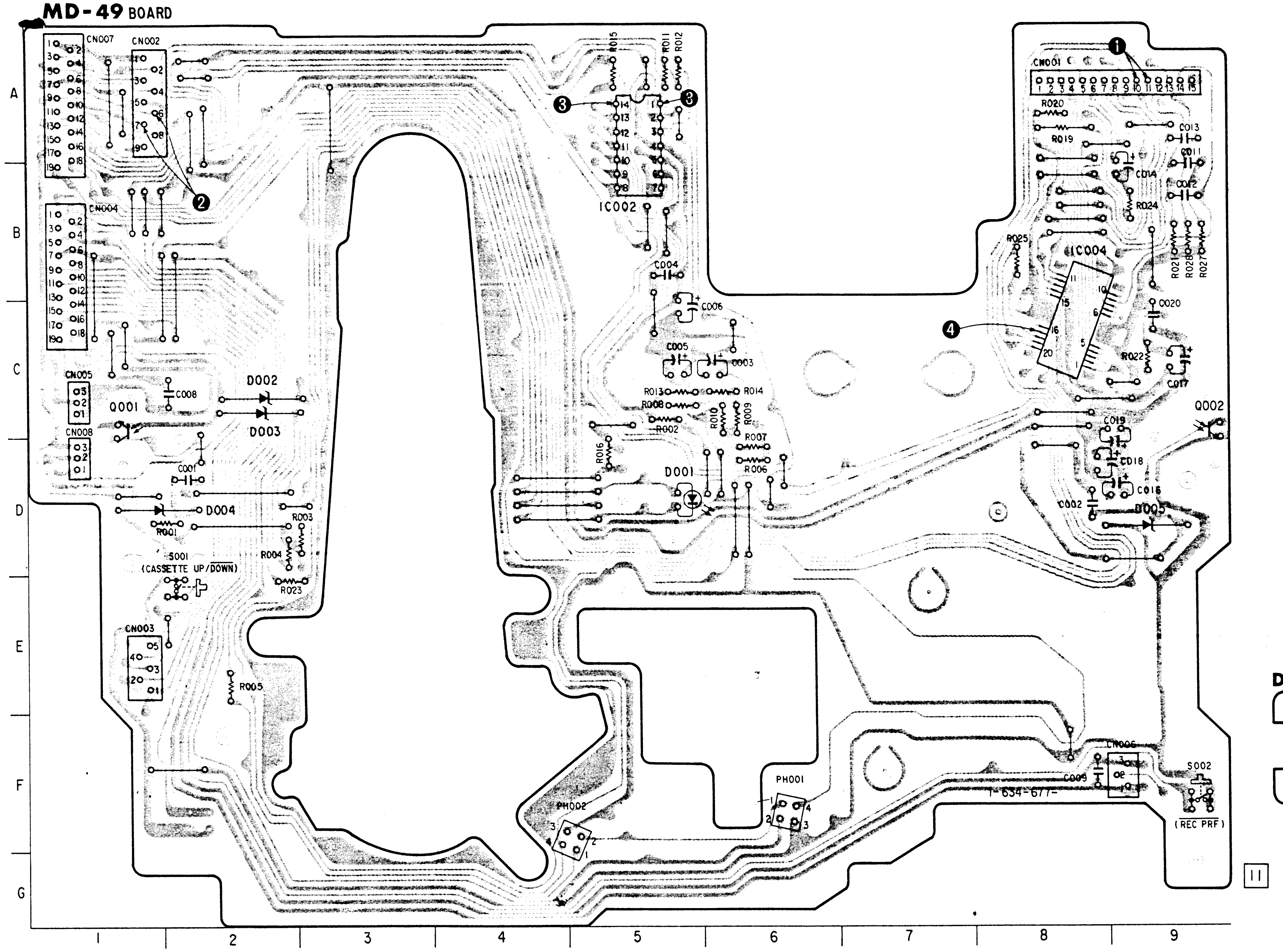
- Signal paths

	AUDIO SIGNAL
REC	➡
PB	⇨

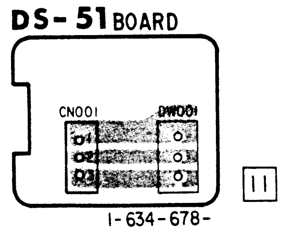
,AUDIO CTL,OSD AUDIO

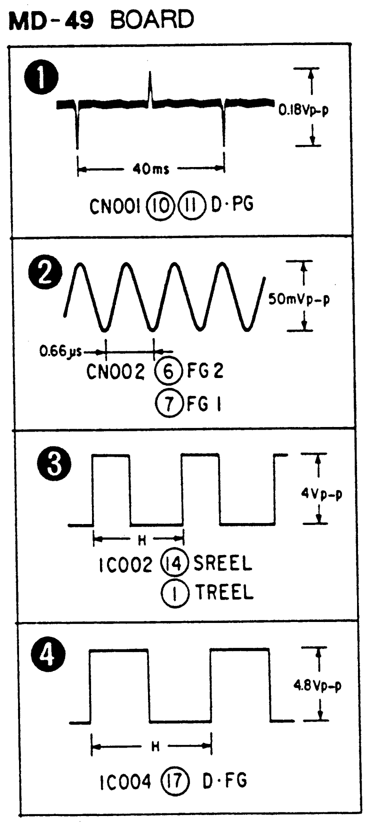
MD-49 (MECHANISM DRIVE), DS-51 (DEW SENSOR) PRINTED WIRING BOARD

– Ref. No. : MD-49 and DS-51 Boards ; 4,000 series –


MD-49 BOARD
CN007
CN002
CN004
CN005
CN008
CN003
CN001
CN006
IC002
IC004
Q001
Q002
D001
D002
D003
D004
D005
PH001
PH002
S001
(CASSETTE UP/DOWN)
S002
(REC PRF)
C001
C002
C003
C004
C005
C006
C008
C009
C011
C012
C013
C014
C016
C017
C018
C019
C020
R001
R002
R003
R004
R005
R006
R007
R008
R009
R010
R011
R012
R013
R014
R015
R016
R019
R020
R021
R022
R023
R024
R025
R026
R027
R028
1-634-677-
11
A
B
C
D
E
F
G
1
2
3
4
5
6
7
8
9

MD-49 BOARD	
CN001	A-8
CN002	A-1
CN003	E-1
CN004	B-1
CN005	C-1
CN006	F-9
CN007	A-1
CN008	D-1
D001	D-5
D002	C-2
D003	C-2
D004	D-1
D005	D-9
IC002	A-5
IC004	C-8
PH001	F-6
PH002	F-4
Q001	C-1
Q002	C-9

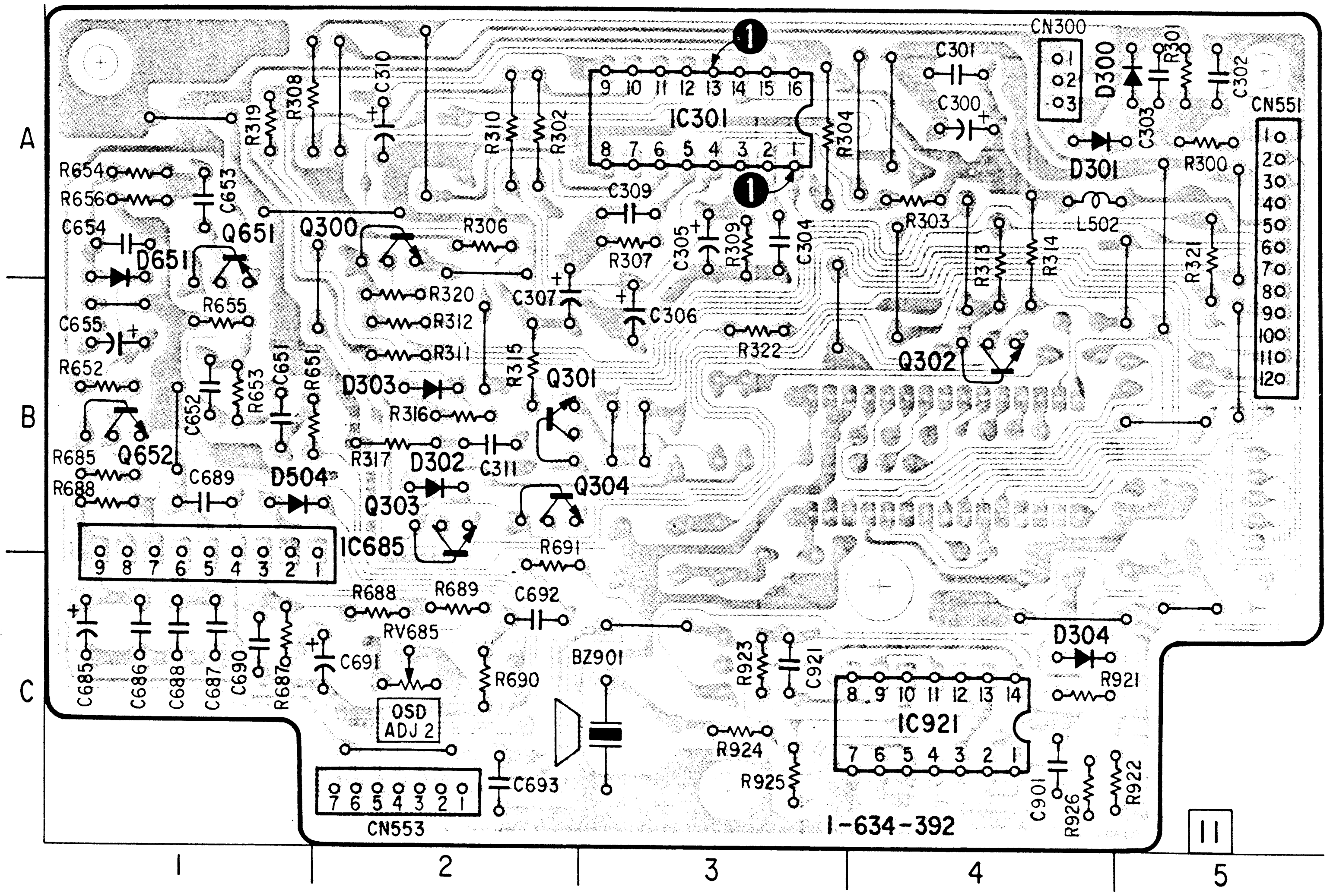

DS-51 BOARD
CN001
DW001
1-634-678-
11



CT-32 (CTL, OSD) PRINTED WIRING BOARD

– Ref. No. : CT-32 Board ; 3,000 series –

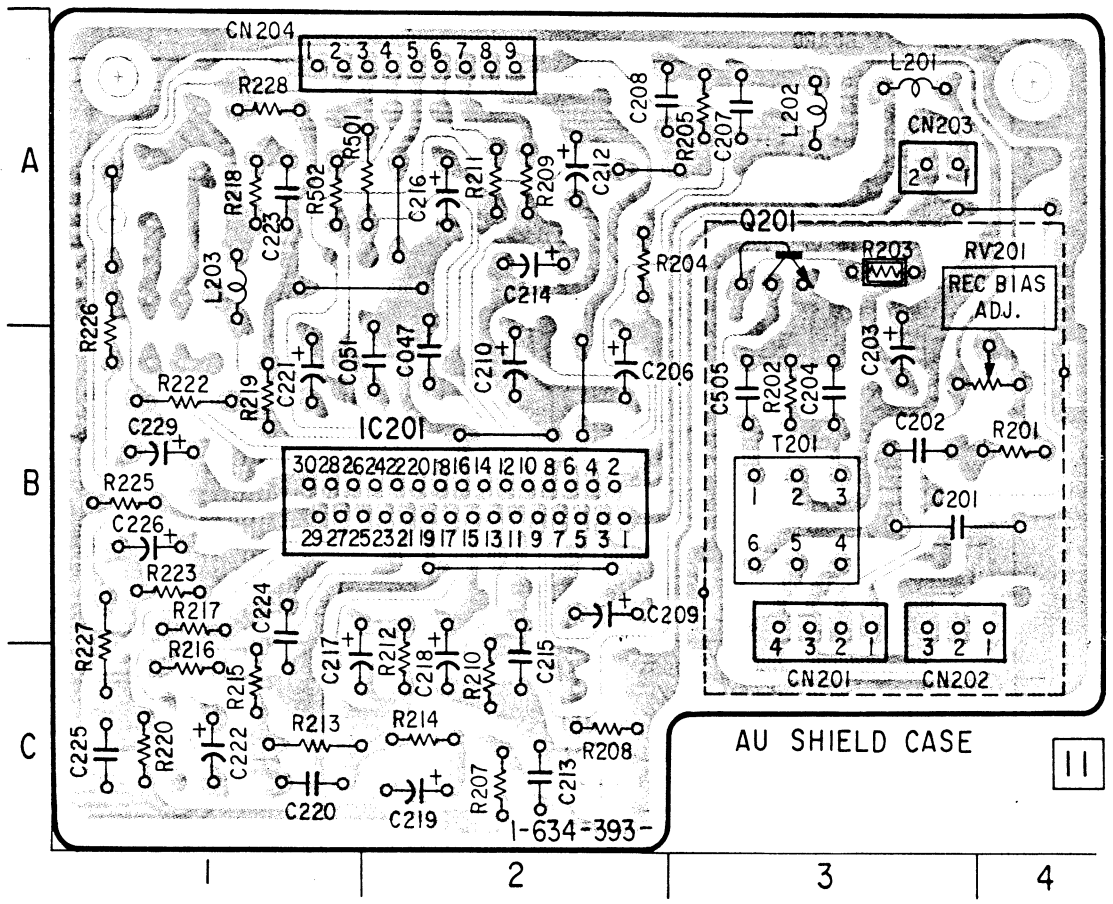
CT-32 BOARD


A
B
C
1
2
3
4
5
IC301
IC685
IC921
CN300
CN551
CN553
D300
D301
D302
D303
D304
D504
D651
Q300
Q301
Q302
Q303
Q304
Q651
Q652
RV685
OSD ADJ 2
BZ901
L502
R300
R302
R303
R304
R306
R307
R308
R309
R310
R311
R312
R313
R314
R315
R316
R317
R319
R320
R321
R322
R651
R652
R653
R654
R655
R656
R685
R687
R688
R689
R690
R691
R921
R922
R923
R924
R925
R926
C300
C301
C302
C303
C304
C305
C306
C307
C309
C310
C311
C651
C652
C653
C654
C655
C685
C686
C687
C688
C689
C690
C691
C692
C693
C901
C921
1-634-392
11

AU-90 (AUDIO) PRINTED WIRING BOARD

– Ref. No. : AU-90 Board ; 3,000 series –

AU-90 BOARD


A
B
C
1
2
3
4
IC201
Q201
T201
RV201
REC BIAS ADJ.
CN201
CN202
CN203
CN204
AU SHIELD CASE
L201
L202
L203
R201
R202
R203
R204
R205
R207
R208
R209
R210
R211
R212
R213
R214
R215
R216
R217
R218
R219
R220
R222
R223
R225
R226
R227
R228
R501
R502
C047
C051
C201
C202
C203
C204
C206
C207
C208
C209
C210
C212
C213
C214
C215
C216
C217
C218
C219
C220
C221
C222
C223
C224
C225
C226
C229
C505
1-634-393
11

AU – 90 BOARD

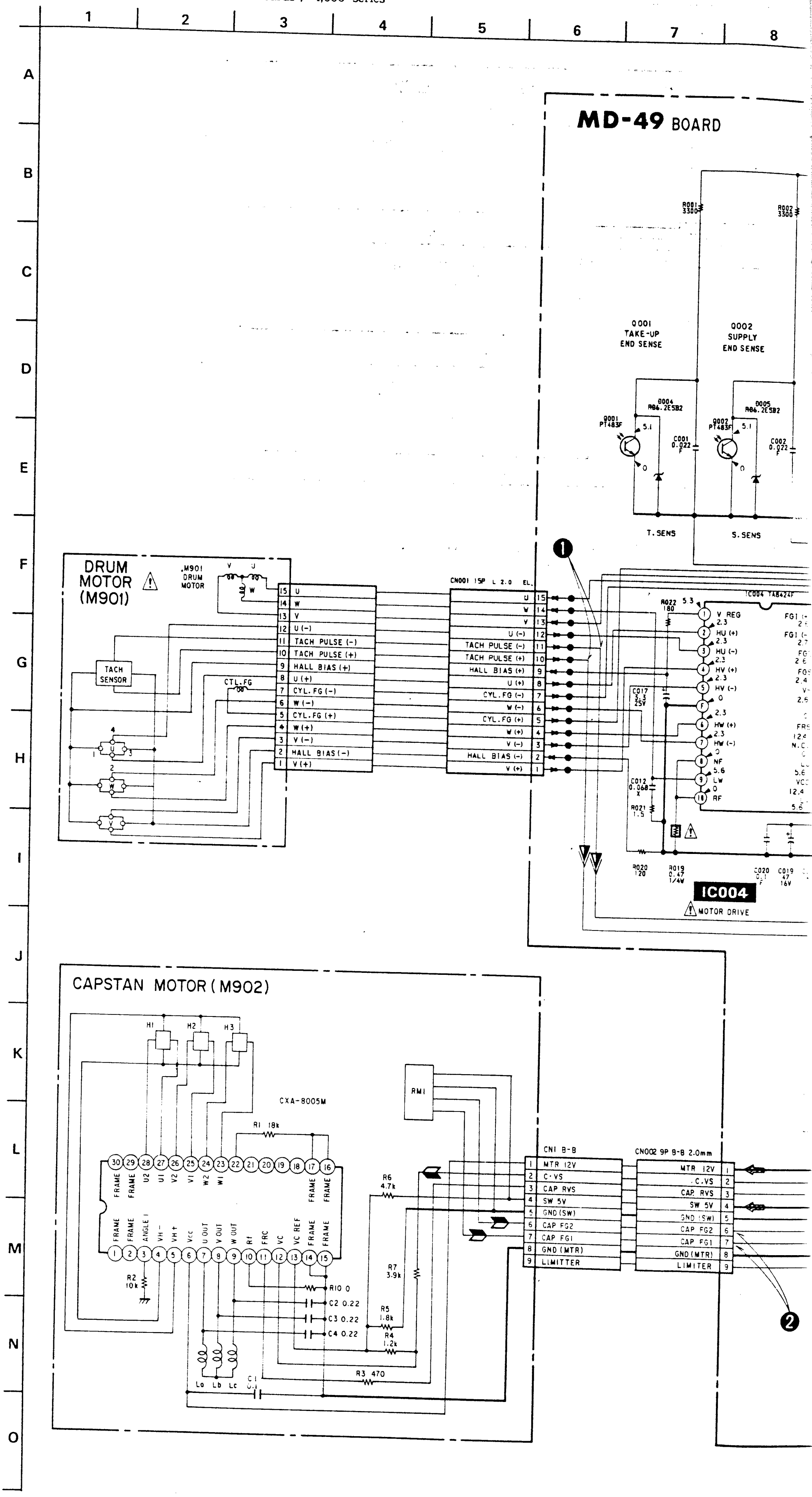
CN201	C-3
CN202	C-3
CN203	A-3
CN204	A-2
IC201	B-2
Q201	A-3
RV201	B-4

CT – 32 BOARD

CN300	A-4
CN551	A-5
CN553	C-2
D300	A-5
D301	A-4
D302	B-2
D303	B-2
D304	C-4
D504	B-1
D651	A-1
IC301	A-3
IC685	B-1
IC921	C-4
Q300	A-2
Q301	B-2
Q302	B-4
Q303	B-2
Q304	B-2
Q651	A-1
Q652	B-1
RV685	C-2

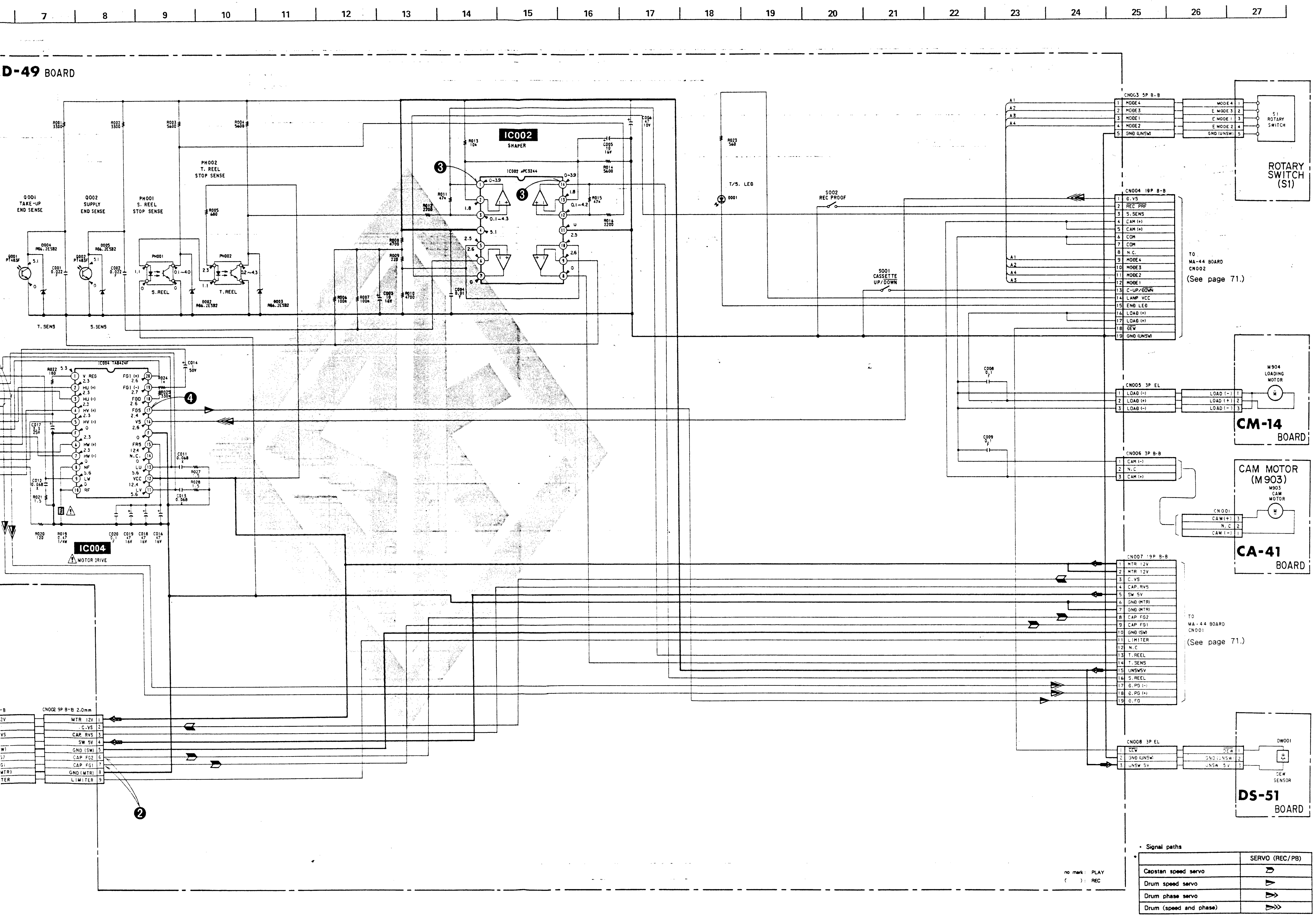
MD-49 (MECHANISM DRIVE), DRUM MOTOR (M901), CAPSTAN MOTOR (M903), DS-51 (DEW SENSOR

– Ref. No. : MD-49 and DS-51 Boards ; 4,000 series –



1
2
3
4
5
6
7
8
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
MD-49 BOARD
R001 3300
R002 3300
Q001 TAKE-UP END SENSE
Q002 SUPPLY END SENSE
Q001 PT483F
Q002 PT483F
D004 RD6.2ESB2
D005 RD6.2ESB2
C001 0.022 F
C002 0.022 F
T.SENS
S.SENS
DRUM MOTOR (M901)
M901 DRUM MOTOR
TACH SENSOR
CTL.FG
CN001 15P L 2.0 EL
U
W
V
U(-)
TACH PULSE(-)
TACH PULSE(+)
HALL BIAS(+)
U(+)
CYL.FG(-)
W(-)
CYL.FG(+)
W(+)
V(-)
HALL BIAS(-)
V(+)
R022 180
IC004 TA8424F
V REG
HU(+)
HU(-)
HV(+)
HV(-)
HW(+)
HW(-)
NF
LW
RF
C017 3.3 25V
C012 0.068
R021 1.5
R020 120
R019 0.47 1/4W
C020
C019 47 16V
IC004
MOTOR DRIVE
CAPSTAN MOTOR (M902)
H1
H2
H3
RM1
CXA-8005M
R1 18k
R2 10k
R6 4.7k
R7 3.9k
R5 1.8k
R4 1.2k
R3 470
R10 0
C2 0.22
C3 0.22
C4 0.22
C1 0.1
La
Lb
Lc
FRAME
U2
U1
V2
V1
W2
W1
ANGLE I
VH-
VH+
Vcc
U OUT
V OUT
W OUT
Rf
FRC
VC
VC REF
CN1 8-B
CN002 9P B-B 2.0mm
MTR 12V
C.VS
CAP RVS
SW 5V
GND (SW)
CAP FG2
CAP FG1
GND (MTR)
LIMITTER
LIMITER

903), DS-51 (DEW SENSOR) SCHEMATIC DIAGRAM

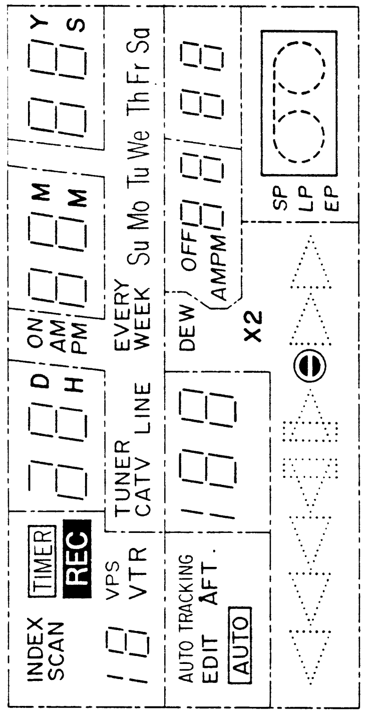

7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
D-49 BOARD
R001 3300
R002 3300
R003 5600
R004 5600
R005 680
Q001 TAKE-UP END SENSE
Q002 SUPPLY END SENSE
PH001 S. REEL STOP SENSE
PH002 T. REEL STOP SENSE
Q001 PT483F
Q002 PT483F
D004 RB6.2ESB2
D005 RB6.2ESB2
D002 RB6.2ESB2
D003 RB6.2ESB2
C001 0.022 F
C002 0.022 F
PH001
PH002
S.REEL
T.REEL
T. SENS
S. SENS
IC002
SHAPER
IC002 μPC3244
R006 100k
R007 100k
C003 10 16V
R008 4700
R009 220
R010 4700
R011 47k
R012 2200
R013 10k
C004 0.01 Y
C005 10 16V
C006 47 10V
R014 5600
R015 47k
R016 2200
R023 560
T/S. LED
D001
S002 REC PROOF
S001 CASSETTE UP/DOWN
IC004 TA8424F
V REG
HU (+)
HU (-)
HV (+)
HV (-)
HW (+)
HW (-)
NF
LW
RF
FG1 (+)
FG1 (-)
FGO
FGS
VS
FRS
N.C.
LU
VCC
LV
R022 180
R024 1k
R025 330k
C014 1 50V
C017 3.3 25V
C012 0.068 X
R021 1.5
C011 0.068 X
R027 1.5
R028 1.5
C013 0.068 X
R020 120
R019 0.47 1/4W
C020 0.1 F
C019 47 16V
C018 47 16V
C016 47 16V
IC004
MOTOR DRIVE
CN002 9P B-B 2.0mm
MTR 12V
C.VS
CAP. RVS
SW 5V
GND (SW)
CAP FG2
CAP FG1
GND (MTR)
LIMITER
CN003 5P B-B
MODE4
MODE3
MODE1
MODE2
GND (UNSW)
E MODE 3
E MODE 1
E MODE 2
S1 ROTARY SWITCH
ROTARY SWITCH (S1)
CN004 19P B-B
D.VS
REC PRF
S.SENS
CAM (+)
COM
N.C.
C-UP/DOWN
LAMP VCC
END LED
LOAD (+)
DEW
TO MA-44 BOARD CN002
(See page 71.)
C008 0.1
C009 0.1
CN005 3P EL
LOAD (-)
M904 LOADING MOTOR
CM-14 BOARD
CN006 3P B-B
CAM (-)
N.C
CAM MOTOR (M903)
M903 CAM MOTOR
CN001
CA-41 BOARD
CN007 19P B-B
MTR 12V
C.VS
CAP. RVS
SW 5V
GND (MTR)
CAP FG2
CAP FG1
GND (SW)
LIMITER
N.C
T.REEL
T.SENS
UNSW5V
S.REEL
D.PG (-)
D.PG (+)
D.FG
TO MA-44 BOARD CN001
(See page 71.)
CN008 3P EL
DEW
GND (UNSW)
UNSW 5V
DW001
DEW SENSOR
DS-51 BOARD
no mark : PLAY
( ) : REC

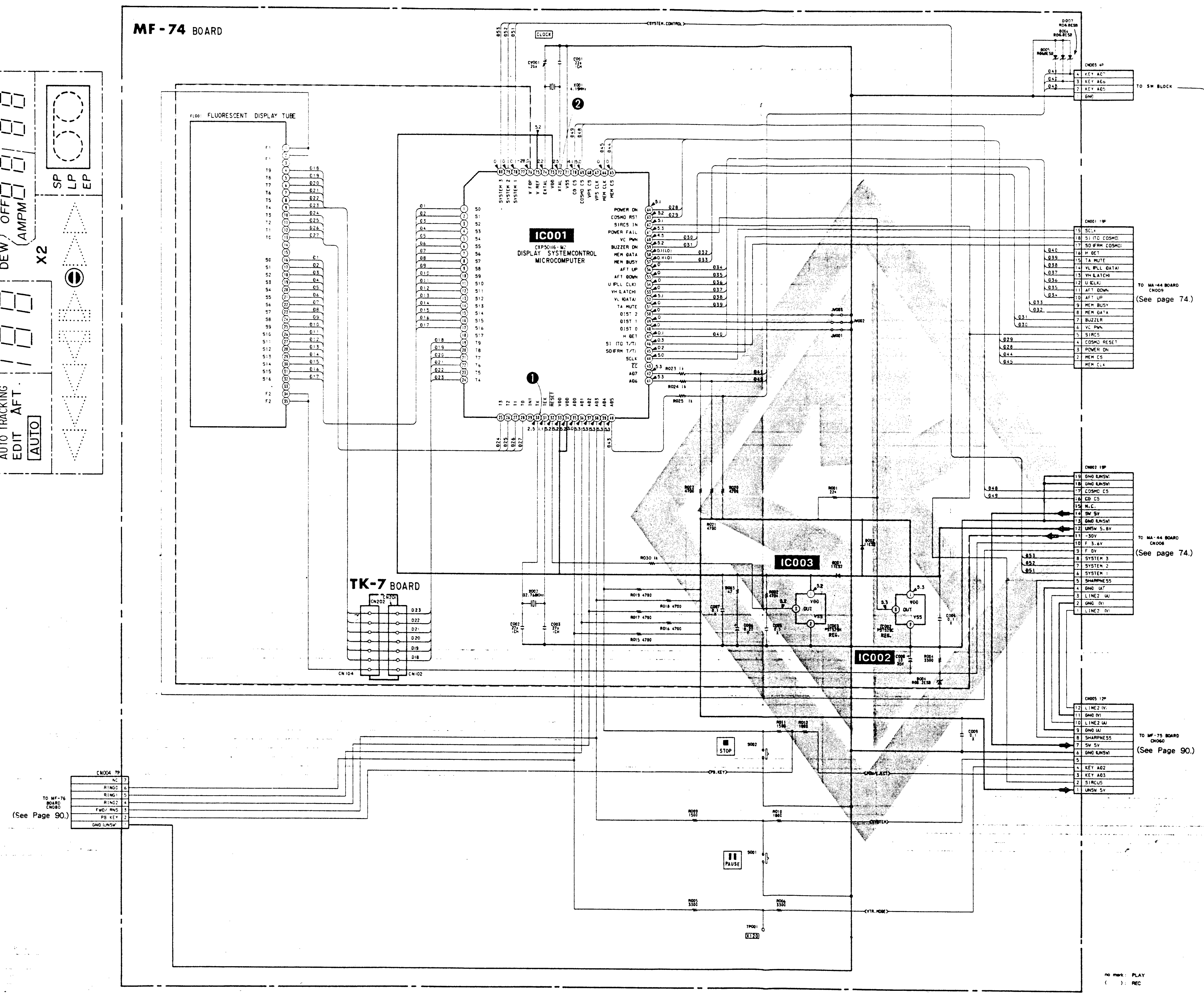
- Signal paths

	SERVO (REC/PB)
Capstan speed servo	▷
Drum speed servo	▷
Drum phase servo	▷>
Drum (speed and phase)	▷>>

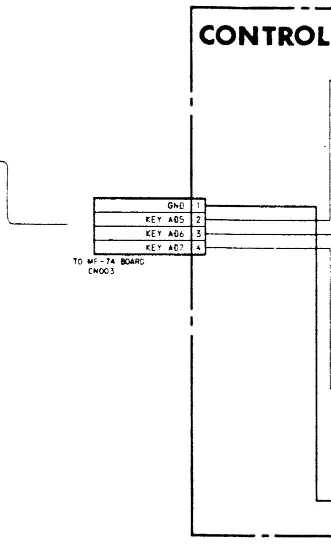
MF-74 (TIMER, MODE CONTROL), TK-7 SCHEMATIC DIAGRAM

- Ref. No.: MF-74 and TK-7 Boards; 6,000 series -


TIMER
REC
VPS
VTR
INDEX
SCAN
AUTO TRACKING
EDIT AFT
AUTO
TUNER
CATV LINE
D
H
EVERY
WEEK
DEW
ON
AM
PM
Su Mo Tu We Th Fr Sa
OFF
AMPM
M
Y
S
X2
SP
LP
EP

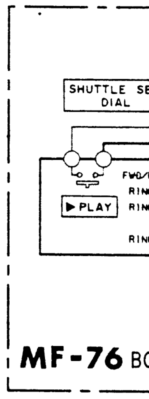

MF-74 BOARD
FL001 FLUORESCENT DISPLAY TUBE
IC001
CXP50116-M2
DISPLAY SYSTEMCONTROL
MICROCOMPUTER
IC002
IC003
TK-7 BOARD
CN202
CN201
CN104
CN102
CLOCK
SYSTEM CONTROL
TO SW BLOCK
CN001 4P
KEY A07
KEY A06
KEY A05
GND
CN003 15P
TO MA-44 BOARD CN009
(See page 74.)
CN002 19P
TO MA-44 BOARD CN006
(See page 74.)
CN005 12P
TO MF-75 BOARD CN060
(See Page 90.)
CN004 7P
TO MF-76 BOARD CN080
(See Page 90.)
STOP
PAUSE
PB KEY
VTR MODE
no mark : PLAY
( ) : REC

CONTROL SWITCH BLOCK SCHE


CONTROL
GND
KEY A05
KEY A06
KEY A07
TO MF-74 BOARD CN003

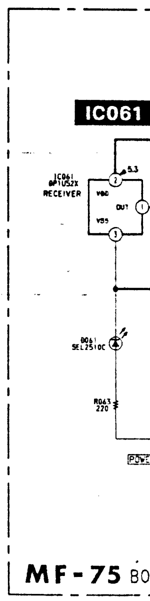
MF-76 (SHUTTLE SEARCH DIA

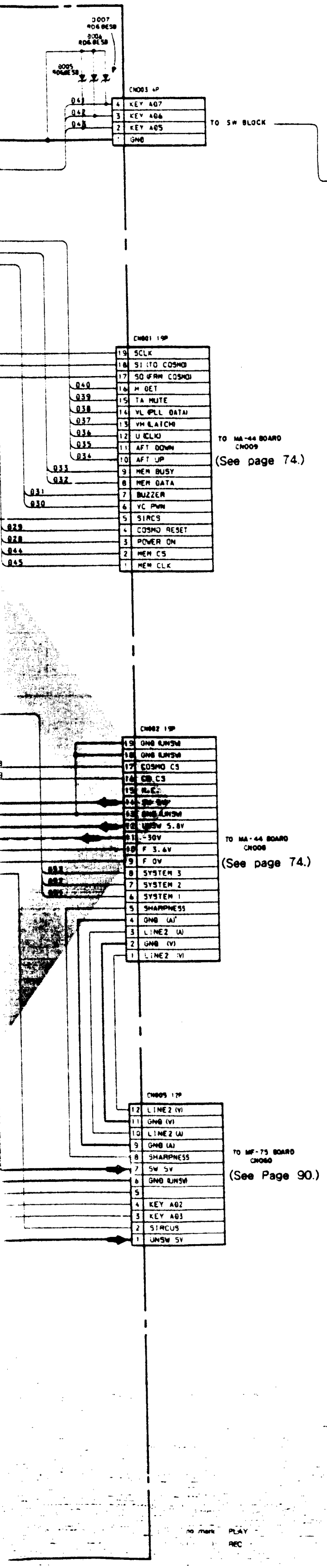
- Ref. No.: MF-76 Board: 6,000 se


SHUTTLE SE DIAL
PLAY
MF-76 BO

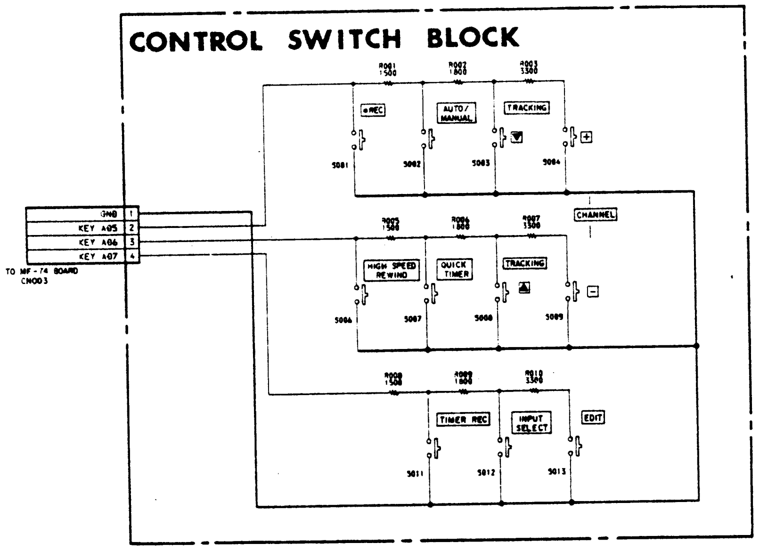
MF-75 (SIRCS, LINE IN 2, MOD

- Ref. No.: MF-75 Board: 6,000 se


IC061
RECEIVER
MF-75 BO

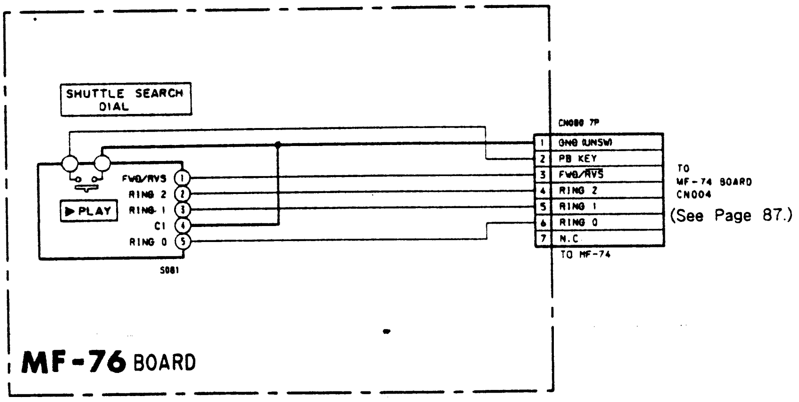

CN003 4P
KEY A07
KEY A06
KEY A05
GND
TO SW BLOCK
CN001 19P
SCLK
SI (TO COSMO)
SO (FRM COSMO)
H DET
TA MUTE
VL (PLL DATA)
VH (LATCH)
U (CLK)
AFT DOWN
AFT UP
MEM BUSY
MEM DATA
BUZZER
VC PWM
SIRCS
COSMO RESET
POWER ON
MEM CS
MEM CLK
TO MA-44 BOARD CN009
(See page 74.)
CN002 19P
GND (UNSW)
COSMO CS
F 3.4V
F 0V
SYSTEM 3
SYSTEM 2
SYSTEM 1
SHARPNESS
GND (A)
LINE2 (A)
GND (V)
LINE2 (V)
TO MA-44 BOARD CN008
(See page 74.)
CN005 12P
LINE2 (V)
GND (V)
LINE2 (A)
GND (A)
SHARPNESS
SW 5V
GND (UNSW)
KEY A02
KEY A03
SIRCUS
UNSW 5V
TO MF-75 BOARD CN060
(See Page 90.)
no mark PLAY
REC

CONTROL SWITCH BLOCK SCHEMATIC DIAGRAM


CONTROL SWITCH BLOCK
R001 1500
R002 1800
R003 3300
●REC
AUTO/MANUAL
TRACKING
S001
S002
S003
S004
GND
KEY A05
KEY A06
KEY A07
TO MF-74 BOARD CN003
CHANNEL
R005 1500
R006 1800
R007 3300
HIGH SPEED REWIND
QUICK TIMER
TRACKING
S006
S007
S008
S009
R008 1500
R009 1800
R010 3300
TIMER REC
INPUT SELECT
EDIT
S011
S012
S013

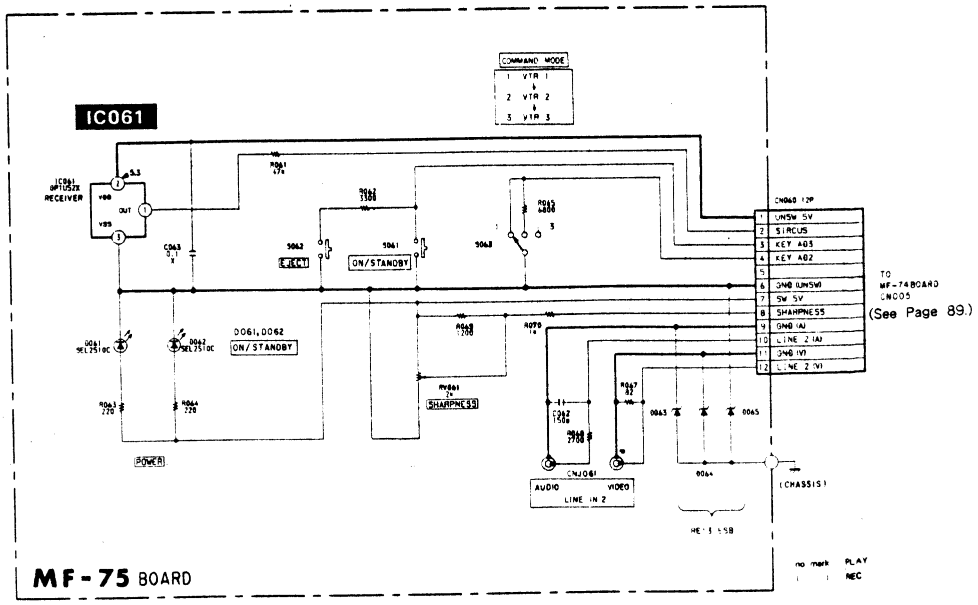
MF-76 (SHUTTLE SEARCH DIAL) SCHEMATIC DIAGRAM

– Ref. No. : MF-76 Board : 6,000 series –


SHUTTLE SEARCH DIAL
▶PLAY
FWD/RVS
RING 2
RING 1
C1
RING 0
S081
CN080 7P
GND (UNSW)
PB KEY
FWD/RVS
RING 2
RING 1
RING 0
N.C
TO MF-74
TO MF-74 BOARD CN004
(See Page 87.)
MF-76 BOARD

MF-75 (SIRCS, LINE IN 2, MODE SWITCH) SCHEMATIC DIAGRAM

– Ref. No. : MF-75 Board ; 6,000 series –

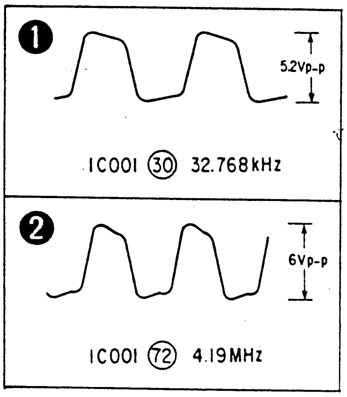

COMMAND MODE
1 VTR 1
2 VTR 2
3 VTR 3
IC061
IC061 GP1U52X RECEIVER
S062
EJECT
S061
ON/STANDBY
S063
D061 SEL2510C
D062 SEL2510C
D061, D062 ON/STANDBY
POWER
RV061
SHARPNESS
CNJ061
AUDIO
VIDEO
LINE IN 2
(CHASSIS)
CN060 12P
UNSW 5V
SIRCUS
KEY A03
KEY A02
GND (UNSW)
SW 5V
SHARPNESS
GND (A)
LINE 2 (A)
GND (V)
LINE 2 (V)
TO MF-74 BOARD CN005
(See Page 89.)
MF-75 BOARD
no mark PLAY
REC

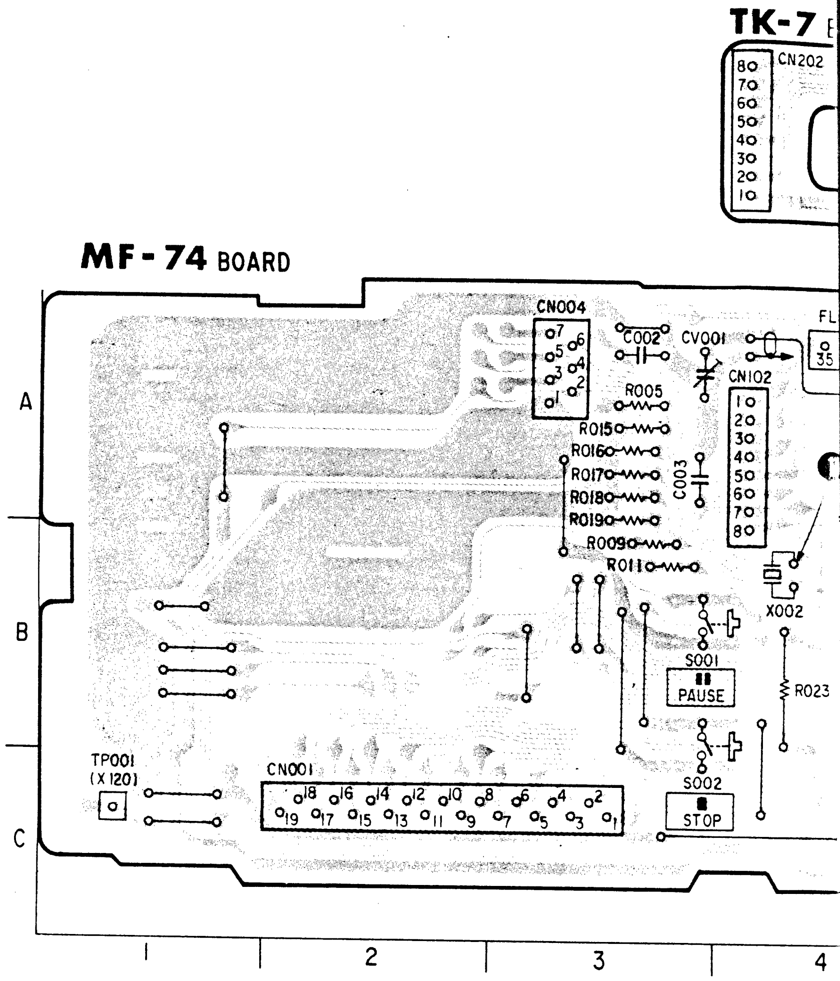
MF-74 (TIMER, MODE CONTROL), TK-7 PRINTED WIRING

– Ref. No.: MF-74 and TK-7 Boards; 6,000 series –

MF – 74 BOARI	
CN001	C-2
CN002	C-5
CN003	C-9
CN004	A-3
CN005	B-9
CN102	A-4
CN104	A-7
D001	B-6
D002	B-6
D004	A-5
D005	B-7
D006	C-7
D007	B-7
D008	B-6
IC001	B-4
IC002	B-6
IC003	B-6

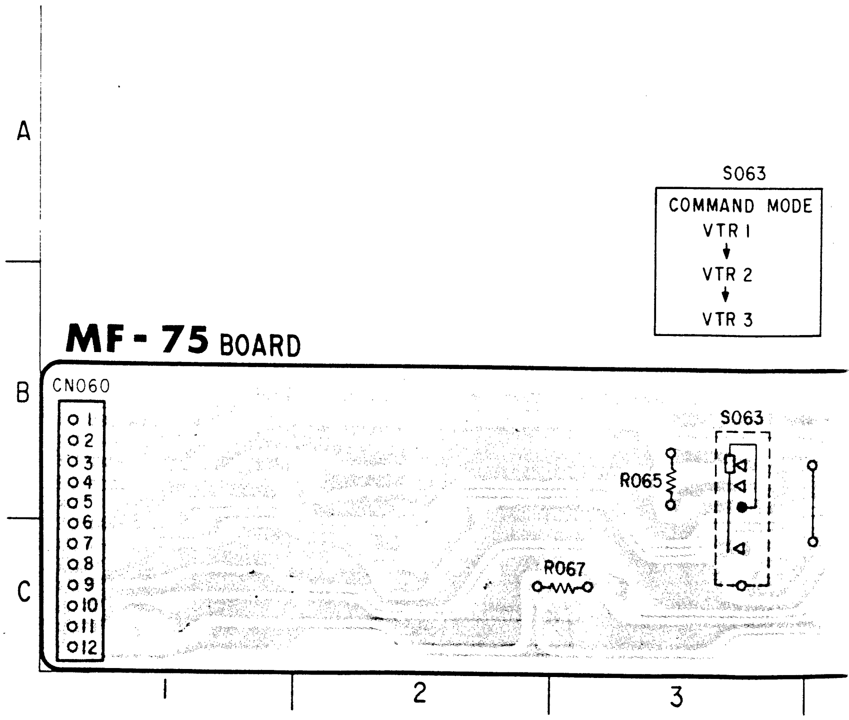
MF-74 BOARD




TK-7
CN202
8
7
6
5
4
3
2
1
MF-74 BOARD
CN004
C002
CV001
FL
35
CN102
R005
R015
R016
R017
R018
R019
R009
R011
C003
X002
S001
PAUSE
R023
S002
STOP
TP001
(X120)
CN001
A
B
C
1
2
3
4

MF-75 (SIRCS, LINE IN 2, MODE SWITCH) PRINTED WIRING

– Ref. No.: MF-75 Board; 6,000 series –

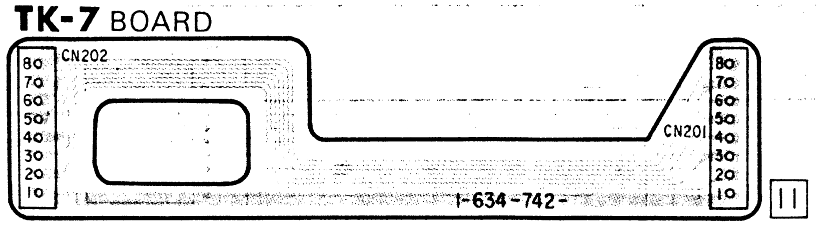

S063
COMMAND MODE
VTR 1
VTR 2
VTR 3
MF-75 BOARD
CN060
S063
R065
R067
A
B
C
1
2
3

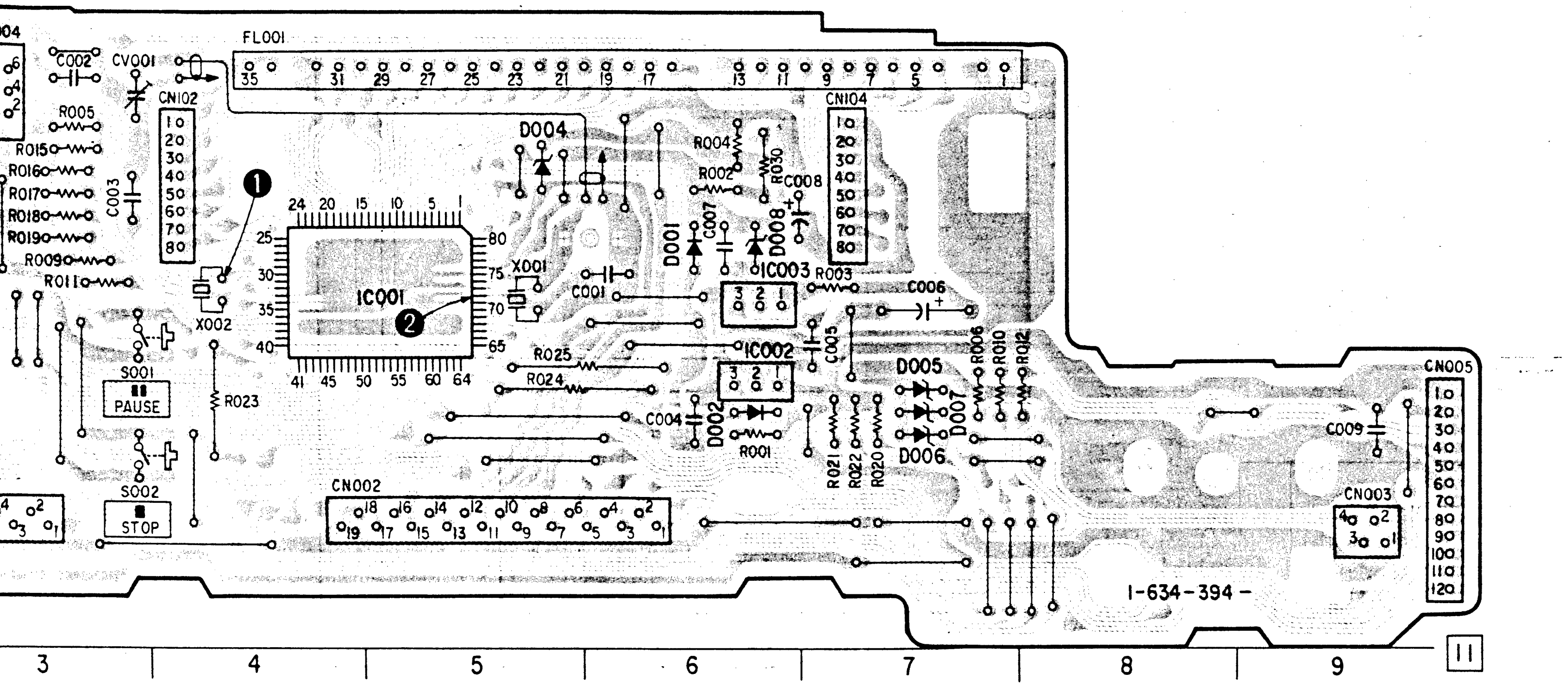
MF – 75 BOARD	
CN060	C-1
D061	A-7
D062	A-8
D063	C-5
D064	C-6
D065	B-7
IC061	C-8
RV061	C-5

TIMER, MODE CONTROL

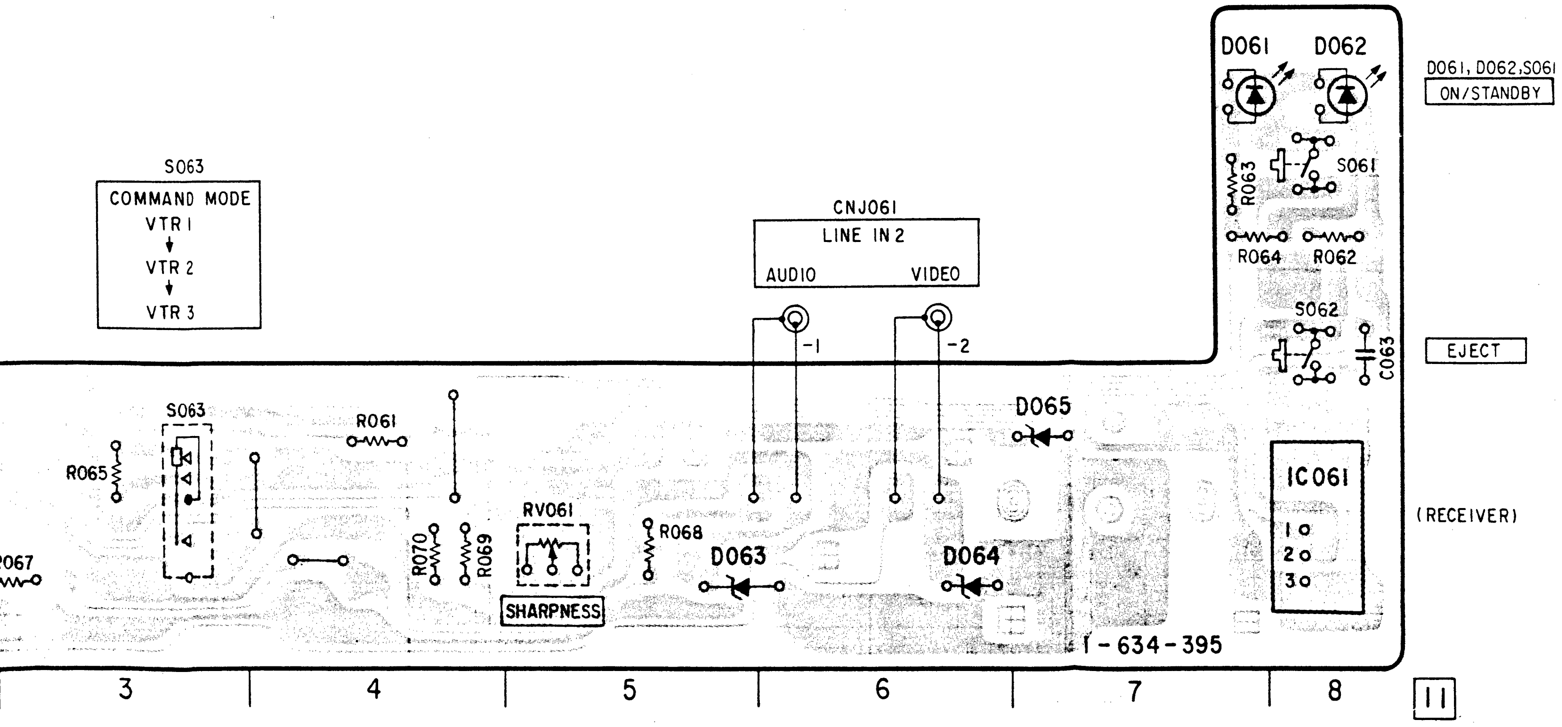
PRINTED WIRING BOARD

series –


TK-7 BOARD
CN202
CN201
8 7 6 5 4 3 2 1
1-634-742
11

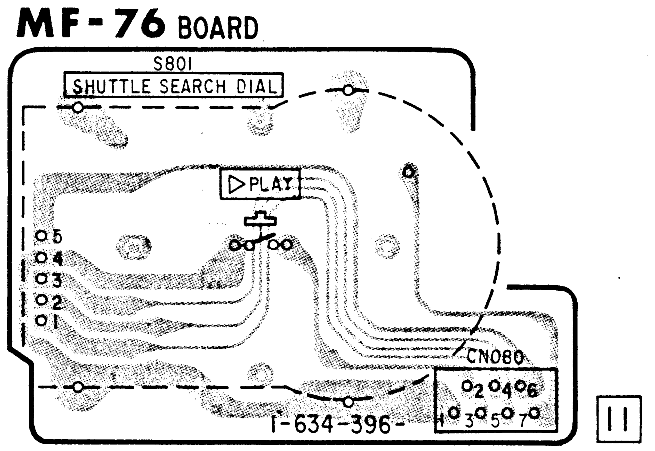

FL001
C002
CV001
CN102
R005
R015
R016
R017
R018
R019
R009
R011
C003
X002
S001
PAUSE
S002
STOP
R023
IC001
24 20 15 10 5 1
25 30 35 40
41 45 50 55 60 64
65 70 75 80
X001
C001
R025
R024
CN002
D004
R004
R002
R030
C008
D001
C007
D008
IC003
R003
C006
IC002
C005
C004
D002
R001
D005
D007
D006
R006
R010
R012
R021
R022
R020
CN104
CN005
C009
CN003
1-634-394
3 4 5 6 7 8 9
11

CH) PRINTED WIRING BOARD


S063
COMMAND MODE
VTR 1
VTR 2
VTR 3
CNJ061
LINE IN 2
AUDIO
VIDEO
-1
-2
D061
D062
D061, D062, S061
ON/STANDBY
R063
S061
R064
R062
S062
C063
EJECT
R061
R065
R067
R070
R069
RV061
SHARPNESS
R068
D063
D064
D065
IC061
1 2 3
(RECEIVER)
1-634-395
3 4 5 6 7 8
11

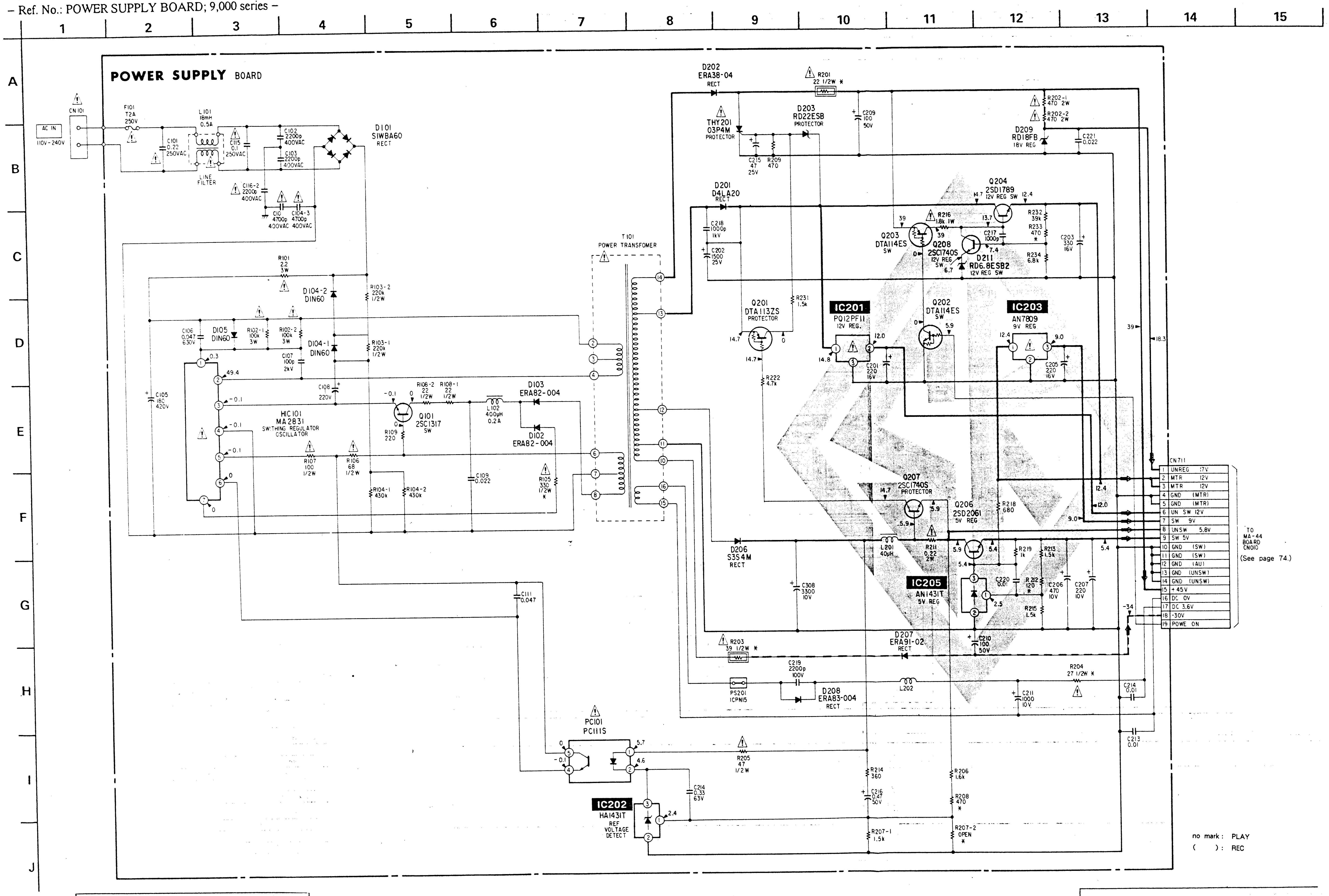
MF-76 (SHUTTLE SEARCH DIAL) PRINTED WIRING BOARD

– Ref. No.: MF-76 Board: 6,000 series –


MF-76 BOARD
S801
SHUTTLE SEARCH DIAL
▷PLAY
5 4 3 2 1
CN080
2 4 6
1 3 5 7
1-634-396
11

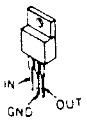
POWER SUPPLY SCHEMATIC DIAGRAM

– Ref. No.: POWER SUPPLY BOARD; 9,000 series –

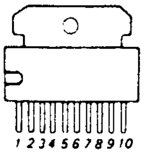

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
POWER SUPPLY BOARD
AC IN
110V-240V
CN101
F101
T2A
250V
C101
0.22
250VAC
L101
18mH
0.5A
LINE FILTER
C115
0.1
250VAC
C102
2200p
400VAC
C103
2200p
400VAC
C116-2
2200p
400VAC
C10
4700p
400VAC
C104-3
4700p
400VAC
D101
S1WBA60
RECT
R101
2.2
3W
D104-2
DIN60
R103-2
220k
1/2W
C106
0.047
630V
D105
DIN60
R102-1
100k
3W
R102-2
100k
3W
C107
100p
2kV
D104-1
DIN60
R103-1
220k
1/2W
C105
180
420V
C108
220V
HIC101
MA2831
SWITHING REGULATOR
OSCILLATOR
49.4
0.3
-0.1
0
Q101
2SC1317
SW
R109
220
R106-2
22
1/2W
R108-1
22
1/2W
L102
400μH
0.2A
D103
ERA82-004
D102
ERA82-004
R107
100
1/2W
R106
68
1/2W
R104-1
430k
R104-2
430k
C109
0.022
R105
330
1/2W
C111
0.047
T101
POWER TRANSFOMER
D202
ERA38-04
RECT
R201
22 1/2W
THY201
03P4M
PROTECTOR
D203
RD22ESB
PROTECTOR
C209
100
50V
C215
47
25V
R209
470
R202-1
470 2W
R202-2
470 2W
D209
RD18FB
18V REG
C221
0.022
D201
D4LA20
RECT
C218
1000p
1kV
C202
1500
25V
Q204
2SD1789
12V REG SW
14.7
12.4
R216
1.8k 1W
13.7
39
C217
1000p
7.4
R232
39k
R233
470
Q203
DTA114ES
SW
Q208
2SC1740S
12V REG SW
D211
RD6.8ESB2
12V REG SW
6.7
R234
6.8k
C203
330
16V
Q201
DTA113ZS
PROTECTOR
R231
1.5k
14.7
R222
4.7k
IC201
PQ12PF11
12V REG.
14.8
12.0
C201
220
16V
Q202
DTA114ES
SW
5.9
IC203
AN7809
9V REG
9.0
C205
220
16V
39
18.3
Q207
2SC1740S
PROTECTOR
Q206
2SD2061
5V REG
R218
680
D206
S3S4M
RECT
L201
40μH
R211
0.22
2W
5.4
R219
1k
R213
1.5k
C308
3300
10V
IC205
AN1431T
5V REG
C220
0.01
R212
120
C206
470
10V
C207
220
10V
2.5
R215
1.5k
-34
R203
39 1/2W
D207
ERA91-02
RECT
C210
100
50V
C219
2200p
100V
PS201
ICPN15
D208
ERA83-004
RECT
L202
R204
27 1/2W
C211
1000
10V
C214
0.01
C213
0.01
PC101
PC111S
5.7
4.6
R205
47
1/2W
C214
0.33
63V
IC202
HA1431T
REF
VOLTAGE
DETECT
2.4
R214
360
C216
0.47
50V
R207-1
1.5k
R206
1.6k
R208
470
R207-2
OPEN
CN711
1 UNREG 17V
2 MTR 12V
3 MTR 12V
4 GND (MTR)
5 GND (MTR)
6 UN SW 12V
7 SW 9V
8 UNSW 5.8V
9 SW 5V
10 GND (SW)
11 GND (SW)
12 GND (AU)
13 GND (UNSW)
14 GND (UNSW)
15 + 45V
16 DC 0V
17 DC 3.6V
18 -30V
19 POWE ON
TO
MA-44
BOARD
CN010
(See page 74.)
no mark : PLAY
( ) : REC

4-3. SEMICONDUCTORS

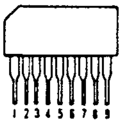
BA178M05



BA6238A


1 2 3 4 5 6 7 8 9 10

BA7021
LVA519S



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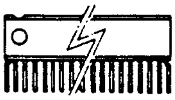

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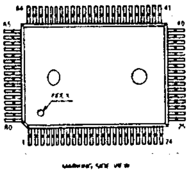
CXP80116-636Q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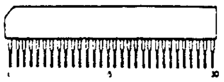
41
65
40
80
1
24

LA7297



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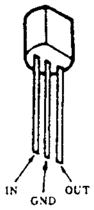

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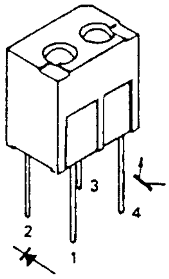

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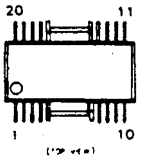
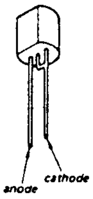
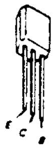


µ PC574J


cathode
anode

DTA114ES
DTA124ES
DTA144ES
DTC114ES
DTC144ES



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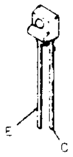

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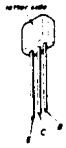

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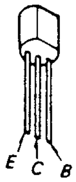

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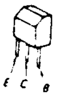

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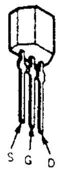

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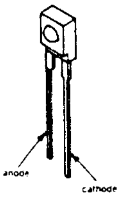
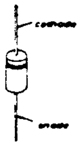
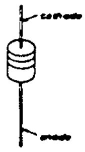

anode
cathode

RD5.1EL2
11ES2


cathode
anode

RD6.2ES-B2
RD6.8ESB2
RD8.2ESB2
1SS119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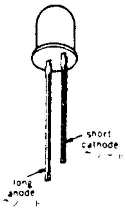
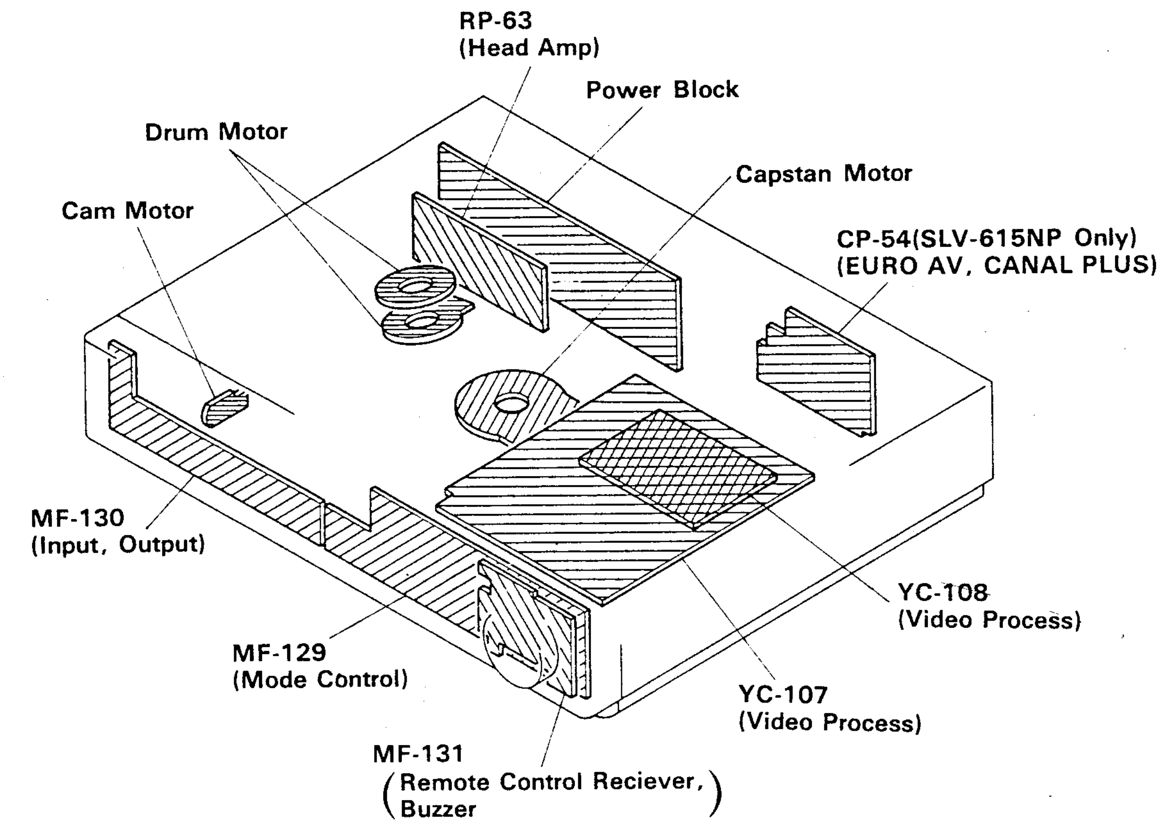
anode

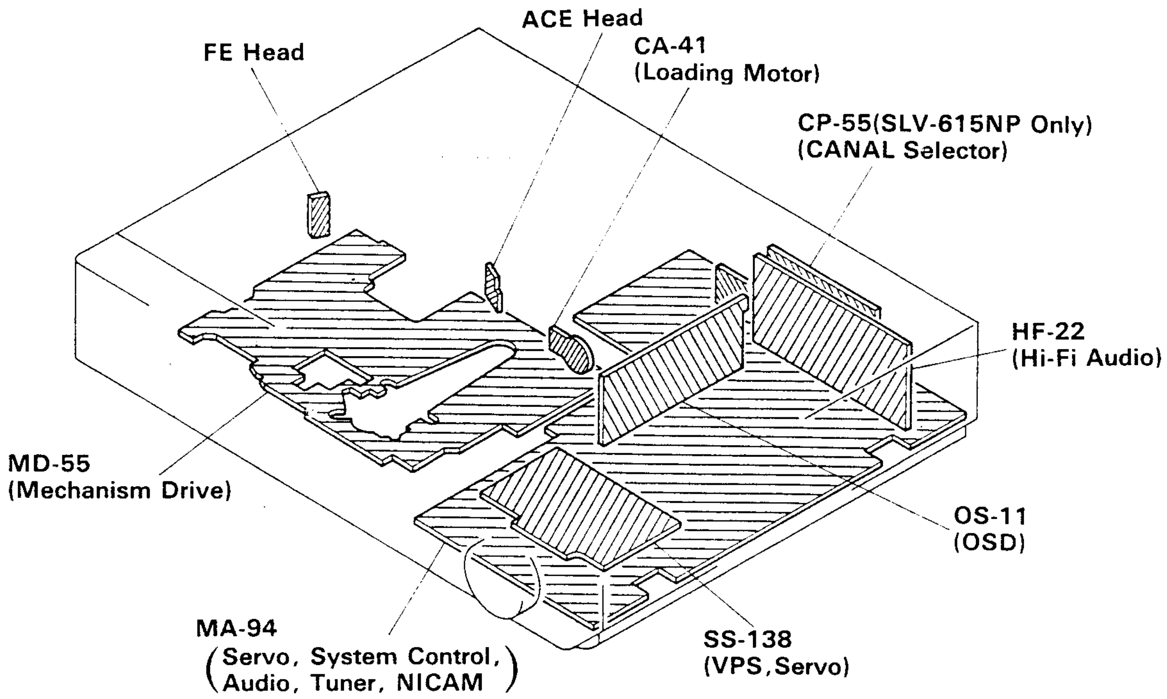
SEL2510C


short
cathode
long
anode

SECTION 3
DIAGRAMS

3-1. CIRCUIT BOARDS LOCATION


RP-63
(Head Amp)
Power Block
Drum Motor
Capstan Motor
Cam Motor
CP-54(SLV-615NP Only)
(EURO AV, CANAL PLUS)
MF-130
(Input, Output)
YC-108
(Video Process)
MF-129
(Mode Control)
YC-107
(Video Process)
MF-131
(Remote Control Reciever, Buzzer)


ACE Head
FE Head
CA-41
(Loading Motor)
CP-55(SLV-615NP Only)
(CANAL Selector)
HF-22
(Hi-Fi Audio)
MD-55
(Mechanism Drive)
OS-11
(OSD)
MA-94
(Servo, System Control, Audio, Tuner, NICAM)
SS-138
(VPS,Servo)

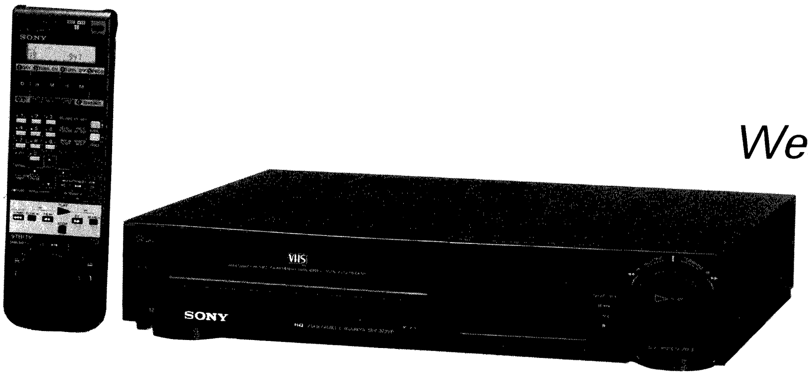
SLV-373/373UB/373VP
RMT-V373

SERVICE MANUAL

AEP Model
SL V-373

UK Model
SL V-373UB

West Germany Model
SL V-373VP



Remote commander RMT-V373 is available as a unit, but as individual parts the battery case lid of commander is only available.

Photo: SLV-373VP

For MECHANICAL ADJUSTMENTS, refer to the "VHS MECHANICAL ADJUSTMENT MANUAL II" (9-972-816-11)

- See Supplement-1 for Adjustments.

SPECIFICATIONS

System

Format	VHS PAL standard
Video recording system	Rotary two-head helical scanning FM system
Video signal	PAL colour (System B and G: SLV-373/373VP, System I: SLV-373UB/373EI) DDR SECAM colour (SLV-373VP) CCIR monochrome signals 625 lines
Tape speed	SP: 23.39 mm/sec. LP: 11.70 mm/sec.
Maximum recording/playback time	SP: 4 hours (with E-240) LP: 8 hours (with E-240)
Fast-froward/rewind time	Approx. 3 min. 20 sec. (with E-180)
High speed rewind time	Approx. 2 min. 20 sec. (with E-180)

Tuner Section

Tuner system (audio)	Intercarrier system
Channel coverage	SLV-373/373VP VHF channels E2 — E12 (A to H only for Italy) CATV channels S01 — S03 CATV channels S1 — S20 HYPER S21 — S41 UHF channels E21 — E69 SLV-373UB UHF channels B21 — B68 SLV-373EI VHF channels A — J UHF channels E21 — E69
RF output signal	SLV-373/373VP/373EI UHF channels E30 — E39 (adjustable) SLV-373UB UHF channels B30 — B39 (adjustable)
Aerial out	75-ohms asymmetrical aerial socket

—Continued on page 2—

VHS PAL VHS VIDEO CASSETTE RECORDER

MICROFILM

SONY®

Inputs and Outputs

Video inputs	LINE 2: phono jacks EURO-AV: 21-pin (pin 20) 1 Vp-p, 75 ohms, unbalanced, sync negative
Audio inputs	LINE 2: phono jacks 47 kilohms, −7.5 dBs (0 dBs = 0.775 V rms) EURO-AV: 21-pin (pins 2 and 6) More than 10 kilohms, −4 dBs
Video output	EURO-AV: 21-pin (pin 19) 1 Vp-p, 75 ohms, unbalanced, sync negative
Audio output	EURO-AV: 21-pin (pins 1 and 3) Output impedance: less than 1 kilohm −4 dBs with 10 kilohms load
CONTROL S IN	Minijack (1)

Timer Section

Clock	Quartz locked
Time indication	24-hour cycle
Timer setting	Only for recording 8 programmes in one month at max.
Timer back-up	Built-in self-charging capacitor Back-up duration: Up to an hour at one time

General

Power requirements	240 V AC, 50 Hz (SLV-373UB) 220 V AC, 50 Hz (SLV-373/373VP/373EI)
Power consumption	25 W
Operating temperature	5°C to 40°C (41°F to 104°F)
Storage temperature	−20°C to 60°C (−4°F to 140°F)
Dimensions	430 × 87 × 358 mm (w/h/d) (17 × 3 3/8 × 14 1/4 inches)
Weight	5.7 kg (12 lb 9 oz)

Wireless Commander RMT-V373

Remote control system	Infrared control
Command mode	VTR 1/2/3
Power requirements	3 V DC, two IEC designation R6 batteries
Dimensions	75 × 45 × 235 mm (w/h/d) (3 × 1 3/4 × 9 1/4 inches)
Weight	220 g (8 oz) excluding batteries

Accessories Supplied

Wireless Remote Commander RMT-V373 with two R6 batteries	(1)
75-ohm coaxial cable	(1)
Screwdriver	(1)
AC power cord	(1)

Design and specifications are subject to change without notice.

Note
This appliance conforms with EEC Directive 87/308/EEC regarding interference suppression.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

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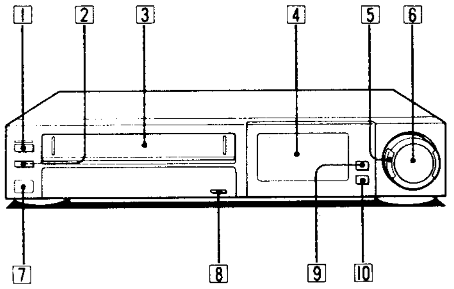
SECTION 1
GENERAL

This section is extracted from instraction manual.

Identifying the Operational Parts



Front

1 **ON/STANDBY switch and indicator**

2 **▲ EJECT button**
Press to eject the cassette. This button does not function during recording.

3 **Cassette compartment**

4 **Display window and function mode display**
See "Indications in the Display Window." (page 58)

5 **DUAL MODE SHUTTLE ring**

In the stop mode	Turn the ring clockwise (▶▶) to advance the tape rapidly, and counterclockwise (◀◀) to rewind the tape.
In the playback mode	Turn the ring clockwise (FORWARD) to advance and counterclockwise (REVERSE) to reverse the picture in various speeds including a still picture when the ring is released.

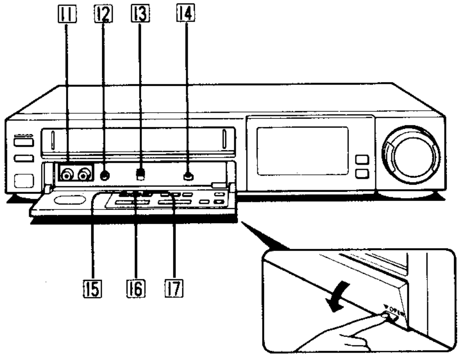
6 **▷ PLAY button**

7 **REMOTE Sensor**
Point the Commander here.

8 **▼ OPEN**
Press to open the front panel.

9 **II/▶◀ PAUSE/STILL button**
In the playback mode: Press to obtain a still picture.
In the recording mode: Press to pause.

10 **■ STOP button**



Front

11 **LINE IN 2 VIDEO/AUDIO jacks (phono type)**
Connect to the video/audio output jacks of another VTR or a video camea recorder.

12 **SHARPNESS SOFT/SHARP control**
Use to adjust the sharpness of the picture if necessary. Normally set this control at the center position.

13 **COMMAND MODE VTR 1/2/3 selector** (page 15)
Set to the same position as the COMMAND MODE switch on the Commander.

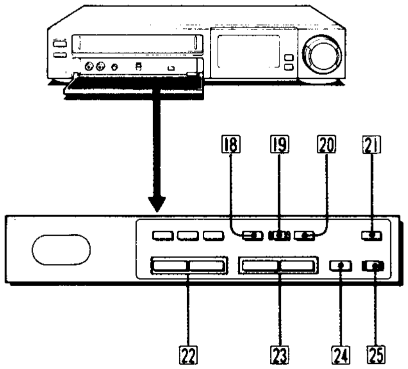
14 **VPS (Video Programme System) ON/OFF switch (SLV-373VP only)** (page 47)

15 **TV/VTR button**
Press and light the VTR indicator in the display window to view the playback of the VTR or a programme selected on the VTR. Press this button again to turn off the VTR indicator to view a programme selected on the TV. This button is effective only when the VTR is connected to the TV via EURO-AV.

16 **INPUT SELECT switch**
Press to select the signals to be recorded by the VTR. The selected mode will be indicated in the display window as follows:
TUNER: To record TV programmes.
LINE L1: To record the signals from equipment connected to the EURO-AV.
LINE L2: To record the signals from equipment connected to the LINE IN 2 jacks.

17 **REC MODE (SP/LP) button**
Press to select the recording tape speed SP or LP.

Identifying the Operational Parts



Front

18 **EDIT ON/OFF button** (page 55)
Set to ON during editing to obtain a high quality picture.

19 **TIMER REC ON/OFF button**
Press this button to enter the timer recording standby mode. Press it again to release the timer recording standby mode before changing or cancelling a timer recording or to operate the unit before a timer recording starts.

20 **QUICK TIMER button** (page 49)
Press to activate the quick timer recording function.

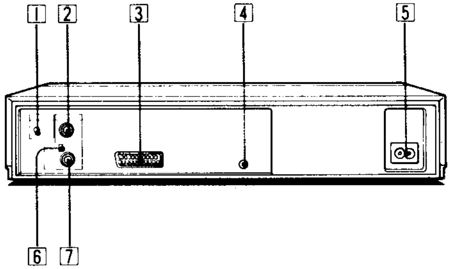
21 **◀◀◀ HIGH SPEED REWIND button**

22 **PROGRAM +/– buttons**
Press to select the programme positions.

23 **TRACKING NORMAL/SLOW and STILL ADJUST ▼/▲ buttons** (page 27)
Press to clear streaks if they appear on the screen in the normal and slow playback. (Manual tracking adjustment)
Press to reduce picture shaking in the still mode. (Still adjustment)

24 **TRACKING AUTO/MANUAL button** (page 27)
Press to reactivate the automatic tracking function after manual tracking adjustment.

25 **● REC (record) button** (page 33)



Rear

1 **RF CHANNEL screw (30 to 39)** (page 18)

2 **AERIAL OUT socket** (page 13)

3 **⊕ EURO-AV (21-pin)** (page 13)

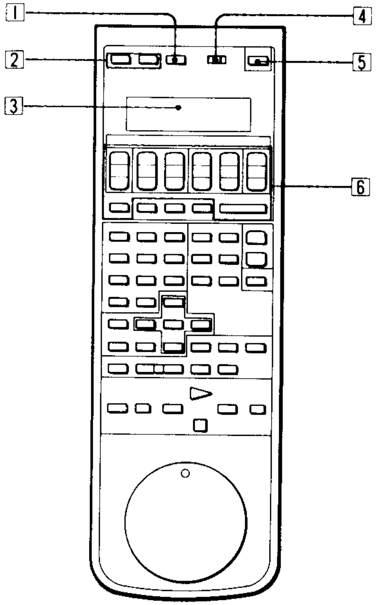
4 **CONTROL S IN jack (mini type)** (page 55)
Connect to the CONTROL S output jack of other SONY products for systematic operations such as synchronized editing.

5 **AC INPUT**
Connect the supplied AC power cord.

6 **DX/LOCAL switch**
Normally set to DX. If the TV signal is very strong, set it to LOCAL with the supplied screwdriver.

7 **AERIAL IN socket** (page 13)

Identifying the Operational Parts



Remote Commander RMT-V373

- The buttons on the Commander with the same name or mark as those on the unit have the same function.
- The buttons with a red dot can be used to remotely control Sony TVs with the ▣ mark when the TV/VTR remote control selector is set to TV.
  However, the TV/VTR button and/or the – / – – (10's digit) button cannot operate certain Sony's TVs.

1 **TIMER REC (ON/OFF) button**

2 **TIMER REC CHECK/CLEAR buttons** (page 43)
Press to check, correct, or clear the tiemr settings.

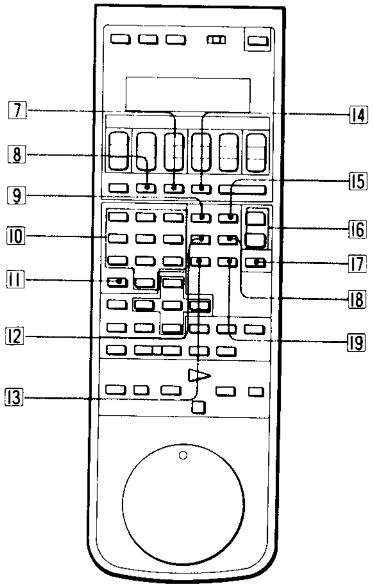
3 **Liquid-crystal display**

4 **TV / VTR remote control selector** (page 15)
Set to VTR to control this VTR and set to TV to control the TV.

5 **⏻ (on/standby) button**
To turn on the TV from the standby mode, press one of the programme position number buttons.

6 **Timer recording/clock set buttons** (page 16, 39)
● TIMER SET
● DAY
● TURN ON time
● TURN OFF time
● PROG (programme position) + / – *
● TRANSMIT

* You can use the PROG + / – buttons to select the programme positions during VTR or TV operation as well as in the timer setting procedure.



7 **MEMORY button** (page 46)

8 **CLOCK SET (SET/START) button** (page 16)

9 **REC MODE select button** (page 33)

10 **Programme position number buttons**
Press to select the programme position directly.

11 **– / – – (10's digit) button**
Press to select a programme number over 9. To select 23, press – / – –, then 2 and 3.

12 **DATA SCREEN button** (page 30)

13 **TIMER ON SCREEN button**
Press to display the timer settings.

14 **COMMAND MODE button** (page 15)

15 **TV/VTR button** (page 35)

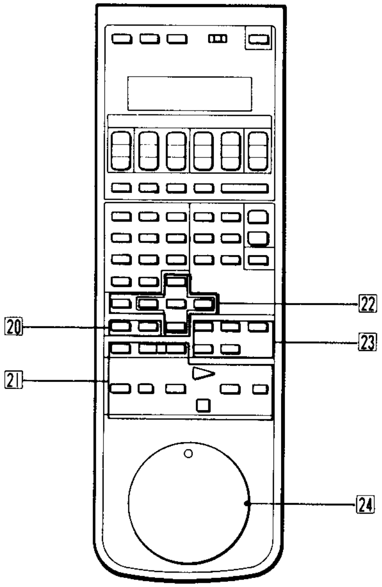
16 **VOL (TV volume) + / – buttons**
Press to control the volume of the TV. Effective only for Sony TVs with the ▣ mark.

17 **INDEX button** (page 52, 53, 54)

18 **INPUT SELECT button**
Press to select the source to be recorded. The selected input mode indicator will appear in the display window.

19 **COUNTER RESET button** (page 36)

Identifying the Operational Parts



20 **INDEX MARK and ERASE buttons** (page 51, 54)

21 **Tape transport buttons** (page 26, 28)
- ıı PAUSE
- ● REC (recording) buttons
- ▷ PLAY
- ◀◀◀ HIGH SPEED REWIND
- ⏩/⏪ SEARCH (reverse/forward)
- ◀◀ REW (rewind)
- ▶▶ FF (fast-forward)
- ■ STOP

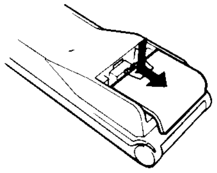
22 **Menu operation buttons**
Press MENU to display or erase the main MENU. Press EXECUTE to store the selected parameters. Press ▲/▼/◀/▶ to move the cursor.

23 **Playback direction set, frame-by-frame, still and SLOW +/– buttons** (page 28)
Press ▸◂ for a still picture.
Press < ◂ıı/ıı▸ > to select the direction for frame-by-frame picture.
Press < ◂ıı/ıı▸ > to select the direction for any playback mode.
Press ı▸SLOW +/– for slow playback between 1/5 to 1/30 times normal speed. Press + or – to change the playback speed.

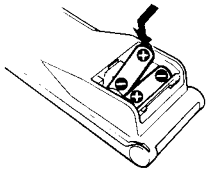
24 **SWING SHUTTLE dial** (page 29)
Turn and hold it at the position where the desired playback speed is obtained. You can select slow (1/5), normal (1), double (x 2) or continuous scan speed (⏩ or ⏪) from any playback mode. Turn the dial clockwise for forward playback, or counterclockwise for reverse playback.
When the dial is released, it will return to the still picture position automatically. To resume normal playback, press ▷.

Remote Control Operation

1



2

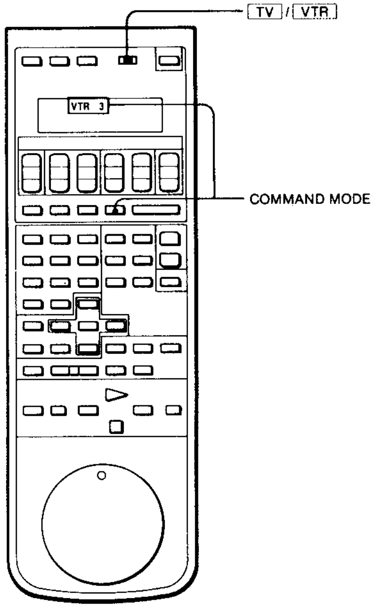


Preparing the Commander

■Battery insertion

1. **Slide and remove the cover.**
2. **Insert two R6 (size AA) batteries with polarity positioned correctly.**
3. **Close the cover. Set the date and clock referring to the "Date and Clock Setting."**

Note on batteries
With normal operation, batteries will last for about six months. However, if the Commander will not be used for a long period, remove the batteries to avoid possible damage from battery leakage.


TV / VTR
VTR 3
COMMAND MODE

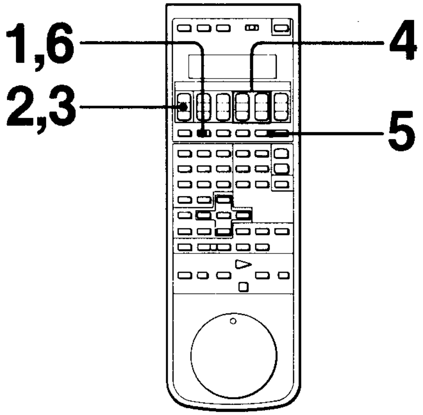
Command Mode Setting

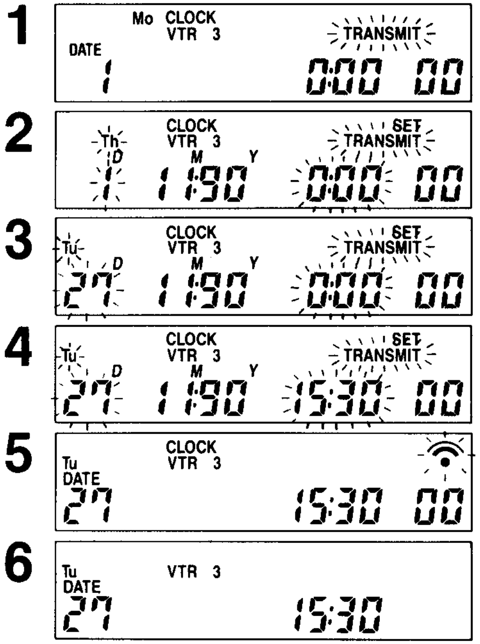
Set the COMMAND MODE 1/2/3 selector on the unit to the same number displayed in the LCD display. To change the setting on the Commander, press COMMAND MODE repeatedly. Then, set the TV / VTR remote control selector to VTR.

Remotely Controlling Other Sony Equipment

- **Controlling another VTR equipped with a command mode selector**
  Set different command modes for this VTR (VTR 3, for instance) and the other VTR (VTR 1). Select VTR 1 on the Commander to control the other VTR and VTR 3 to control this VTR.
- **Controlling equipment without a command mode selector**
  Change the setting on the Commander as follows to control each type of VTR.
  VTR 1: Sony Betamax infrared remote control VTRs
  VTR 2: Sony 8 mm format VTRs
  VTR 3: Sony VHS format VTRs

Date and Clock Setting




1
Mo CLOCK
VTR 3
DATE
1
TRANSMIT
0:00 00
2
Th
D
CLOCK
VTR 3
M Y
1 1:90
SET
TRANSMIT
0:00 00
3
Tu
D
CLOCK
VTR 3
M Y
27 1 1:90
SET
TRANSMIT
0:00 00
4
Tu
D
CLOCK
VTR 3
M Y
27 1 1:90
SET
TRANSMIT
15:30 00
5
Tu
DATE
CLOCK
VTR 3
27
15:30 00
6
Tu
DATE
VTR 3
27
15:30

Before You Begin

The time and date between the years 1990 and 2005 can be set with the Commander.

Operation

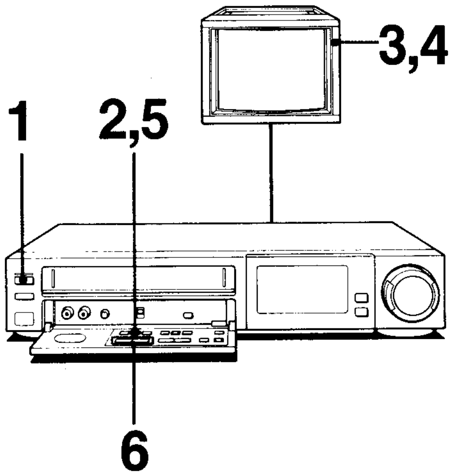
Example: To set to 15:30, Tuesday, November 27, 1990.

1. **Press CLOCK SET.**
2. **Keep pressing the D (date) button until 11 M 90 Y is displayed.**
   The date will be incremented slowly up to 30 days ahead and then the month will be incremented.
3. **Press the + side or – side of the D (date) button until 27 D is displayed.**
   The day of the week appears automatically.
4. **Press the H (hour) and M (minute) buttons under TURN OFF to set the current time.**
5. **Point the Commander at the VTR and press TRANSMIT.**
   A beep sound confirms that the date and clock setting is registered in the VTR as well.
6. **Check the display window on the unit and press CLOCK SET.**

When 0:00 is blinking on the unit
Any time power is interrupted for more than an hour, you will see 0:00 blinking when power is restored. You will have to re-set the date and clock again.

When a short beep sounds repeatedly
The VTR is in the timer recording or quick timer recording modes or standby mode for timer recording and the setting cannot be transmitted.

Adjusting the TV



Before You Begin

If you have connected your VTR and TV using only the aerial sockets, one of the television programme positions must be adjusted to receive the VTR's playback signal. If TV-VTR connection is made via the EURO-AV, skip this step.

Operation

1 **Make connections referring to "Connections" and press ON/STANDBY.**

2 **Press INPUT SELECT to light LINE L2 in the display window.**
Do not connect any equipment to the LINE IN 2 VIDEO jack.

3 **Turn on the TV and select a programme position that is not used to receive a TV station.**

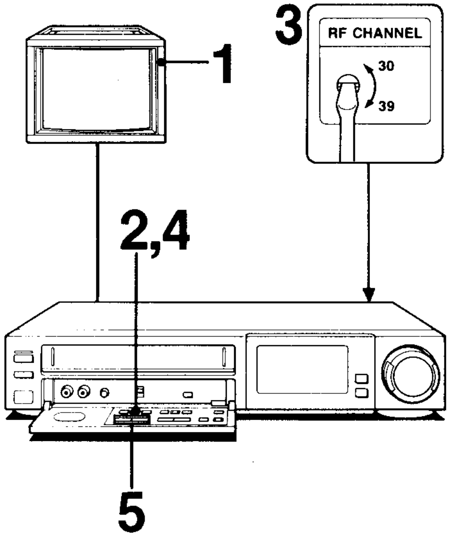
4 **Tune the TV so that a blue screen with tape counter and tape speed indication is clearly displayed on the TV screen.**

5 **Press INPUT SELECT to light TUNER in the display window.**

6 **Press the PROGRAM +/– on the VTR and check that the screen changes to a different programme.**

Now your TV is tuned to receive the VTR's playback picture. Whenever playing back a tape, select the programme position you chose in step 3.
If you are not sure how to tune your TV, refer to the TV's instruction manual or consult your dealer.

Adjusting the TV



When the Playback Picture is not Free of Disturbance

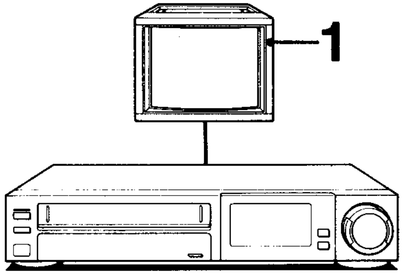
1 **Select a programme position on the TV between UHF channels 30 and 39, so that the TV shows no picture and a steady rustling sound or no sound is heard.**

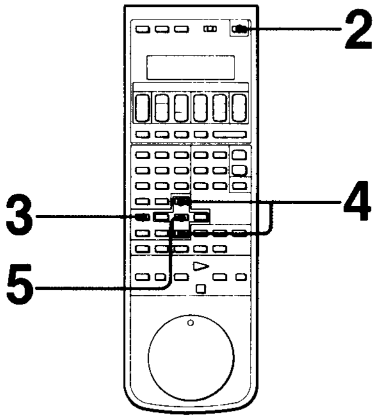
2 **Press INPUT SELECT to light LINE L2 in the display window.**
Do not connect any equipment to the LINE IN 2 VIDEO jack.

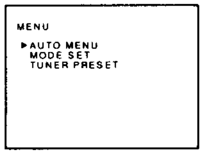
3 **Turn the RF CHANNEL screw with the supplied screwdriver so that a blue screen with tape counter and tape speed indication is clearly displayed on the TV screen.**

4 **Press INPUT SELECT to light TUNER in the display window.**

5 **Press the PROGRAM +/– on the VTR and check that the screen changes to a different programme.**







MENU
▶AUTO MENU
MODE SET
TUNER PRESET

This VTR is equipped with a menu display function. Menu display enables you to perform certain operations which are displayed on the TV or the monitor.

First display the main MENU, and select the item to be operated or preset.

How to Display the main MENU

■Before you begin
Check the connections between the VTR and the TV.

■Operation

1. **Turn on the TV.**
   Set to the programme position for the VTR if VTR-TV connection is made via the aerial sockets. Select VTR input if VTR-TV connection is made via the EURO-AV.
2. **Press ⏻.**
3. **Press MENU.**
   The main MENU will appear on the screen.
4. **Move cursor to the desired menu by ▲ or ▼.**
5. **Press EXECUTE.**
   The selected menu will appear on the screen.

To erase the main MENU display
Press MENU again.

To display other menu displays
1. Press MENU to erase the present display.
2. Press MENU again to display main MENU.
3. Move cursor to the desired menu.
4. Press EXECUTE.

Details of Each Menu

Here is a list of the menus in the main MENU. For details, refer to the sections indicated.

■AUTO MENU
Use to select an automatic tape operation. See "Assigning a Desired Operation Mode" (page 31).

■MODE SET
Use to select the following mode settings:

TIMER REC-REW ON/OFF
(See "Timer Activated recording" on page 44)

BUZZER ON/OFF
(See "Timer Activated Recording" on page 41)

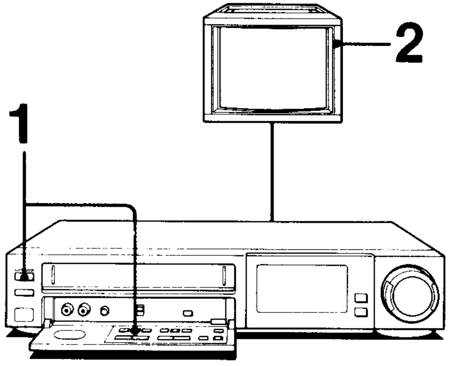
DIMMER ON/OFF
Select ON to dim out the indications in the display window.

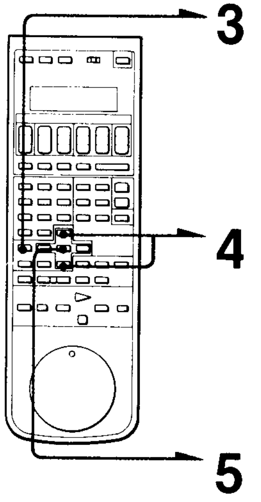
BACK COLOUR BL/GR/PK
Select your favourite back colour of the on-screen display from BL (blue), GR (green) and PK (pink).
Back colour is set to BL at the time of shipment.

■TUNER PRESET
Use to preset the active channels in your area. See "Presetting the Active Channels" (page 21).

Note
The position of the cursor is retained as long as the power cord is connected.

Presetting the Active Channels





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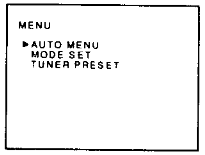
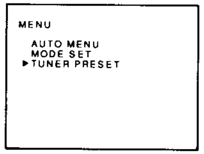


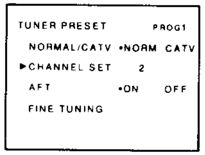
```
MENU
▶AUTO MENU
 MODE SET
 TUNER PRESET
```

4



```
MENU
 AUTO MENU
 MODE SET
▶TUNER PRESET
```

5



```
TUNER PRESET            PROG1
 NORMAL/CATV  •NORM  CATV
▶CHANNEL SET    2
 AFT          •ON    OFF
 FINE TUNING
```

Before You Begin

- This VTR is capable of receiving VHF channels E2-E12, UHF channels E21-E69, and cable TV channels S1-S41 and S01-S03.
- The receivable channels are governed by the TV broadcasting system in your area.
- Up to 60 channels can be allocated to any desired programme position.

To Call Up the TUNER PRESET Menu

1 **Turn on the VTR and press INPUT SELECT to light the TUNER indicator and the programme position number in the display window.**

2 **Turn on the TV.**
Set to the programme position for the VTR if VTR-TV connection is made via the aerial sockets. Select VTR input if VTR-TV connection is made via the EURO-AV.

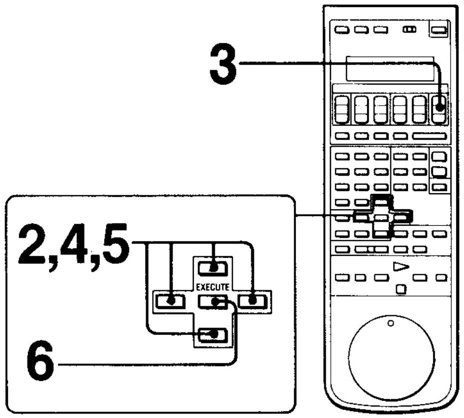
3 **Press MENU with the VTR in the stop mode.**
The main MENU appears.

4 **Move cursor with ▲ or ▼ to TUNER PRESET.**

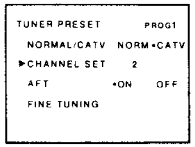
5 **Press EXECUTE.**
The TUNER PRESET menu appears.

Note for the users of SLV-373UB
The TUNER PRESET menu of the SLV-373UB does not have the NORMAL/CATV selection as illustrated.

Presetting the Active Channels

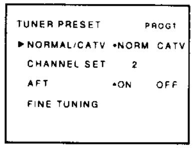


1



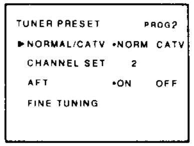
```
TUNER PRESET            PROG1
 NORMAL/CATV   NORM •CATV
▶CHANNEL SET    2
 AFT          •ON    OFF
 FINE TUNING
```

2



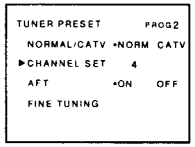
```
TUNER PRESET            PROG1
▶NORMAL/CATV  •NORM  CATV
 CHANNEL SET    2
 AFT          •ON    OFF
 FINE TUNING
```

3



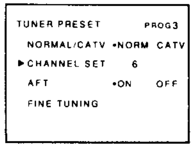
```
TUNER PRESET            PROG2
▶NORMAL/CATV  •NORM  CATV
 CHANNEL SET    2
 AFT          •ON    OFF
 FINE TUNING
```

4



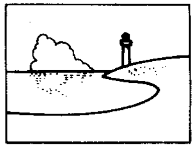
```
TUNER PRESET            PROG2
 NORMAL/CATV  •NORM  CATV
▶CHANNEL SET    4
 AFT          •ON    OFF
 FINE TUNING
```

5



```
TUNER PRESET            PROG3
 NORMAL/CATV  •NORM  CATV
▶CHANNEL SET    6
 AFT          •ON    OFF
 FINE TUNING
```

6



Tuning a Desired Channel

1 **Call up the TUNER PRESET menu.**

2 **Move cursor to NORMAL/CATV with ▲ and select NORM with ◀ or ▶. (For SLV-373UB, skip this step.)**
To tune-in CATV channels first, select CATV.

3 **Select the desired programme position by pressing PROG +/− on the Commander or PROGRAM +/− on the unit.**

4 **Move cursor to CHANNEL SET with ▲ or ▼ and press ◀ or ▶.**
The channel number automatically increases with ▶ and decreases with ◀. The number stops changing when the first channel received in your area is detected and the screen returns to the blue background 5 seconds after.

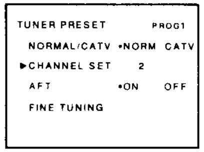
5 **To allocate a channel to the next programme position, repeat steps 2 to 4.**

6 **Press EXECUTE to store the allocated channels and return to original screen.**

Channel scanning on your VTR

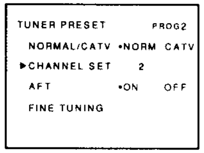
- When ▶ is pressed in steps 4 and 5, the channels are scanned in the following order. When ◀ is pressed the scanning order is reversed.
VHF (E2-E12) → UHF (E21-E69) → CATV (S1-S20) → HYPER BAND (S21-S41) → CATV (S01-S03).
- The SLV-373UB only scans UHF channels B21 to B68.
- In Italy, channel numbers 13 to 20 correspond to channels A to H.

1



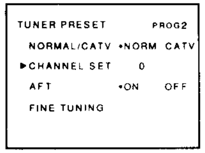
```
TUNER PRESET        PROG1
  NORMAL/CATV •NORM CATV
▶CHANNEL SET    2
  AFT          •ON   OFF
  FINE TUNING
```

2



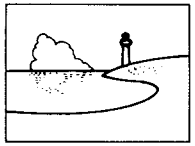
```
TUNER PRESET        PROG2
  NORMAL/CATV •NORM CATV
▶CHANNEL SET    2
  AFT          •ON   OFF
  FINE TUNING
```

3



```
TUNER PRESET        PROG2
  NORMAL/CATV •NORM CATV
▶CHANNEL SET    0
  AFT          •ON   OFF
  FINE TUNING
```

5



Erasing Unwanted Programme Positions

The VTR can be preset so that only the desired programme positions will appear when you press PROG +/– or PROGRAM +/–.

1 Call up the TUNER PRESET menu.

2 Press PROG +/– on the Commander or PROGRAM +/– on the unit to call up the unused programme position.

3 Press 0 twice or keep pressing ◀ or ▶ until 0 is displayed.

4 Repeat steps 2 and 3 to erase other programme positions.

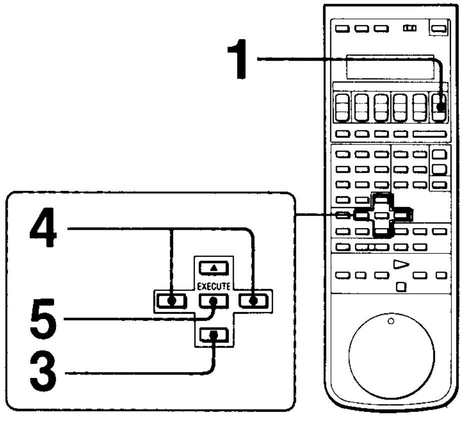
5 Press EXECUTE.

■ **To enter the erased programme positions again**
Follow the operations in "Tuning a Desired Channel."

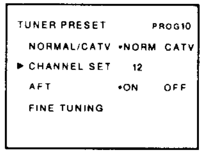
To Allocate the Channels Directly

After step 3 in "Tuning a Desired Channel," move cursor to CHANNEL SET.
Enter the desired programme numbers using the programme position number buttons. To enter one's digits, press 0 and then the desired number. To enter two digit numbers, press the ten's digit number and then the one's digit number.

Presetting the Active Channels

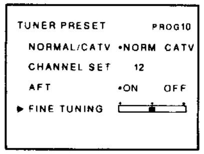


2



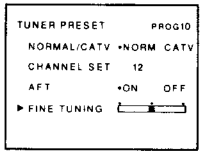
```
TUNER PRESET        PROG10
  NORMAL/CATV •NORM CATV
▶ CHANNEL SET   12
  AFT          •ON   OFF
  FINE TUNING
```

3



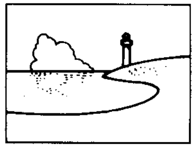
```
TUNER PRESET        PROG10
  NORMAL/CATV •NORM CATV
  CHANNEL SET   12
  AFT          •ON   OFF
▶ FINE TUNING
```

4



```
TUNER PRESET        PROG10
  NORMAL/CATV •NORM CATV
  CHANNEL SET   12
  AFT          •ON   OFF
▶ FINE TUNING
```

5



Manually Fine-tuning a Weak Station

Normally the AFT (Automatic Fine Tuning) function fine-tunes the picture with the AFT in the TUNER PRESET menu set to ON. (The AFT indicator lights in the display window.) However, when the programme received on the VTR is distorted due to signal interference, manual fine tuning may solve the problem.

1 Select the distorted programme position by pressing PROG +/– on the Commander or PROGRAM +/– on the unit.

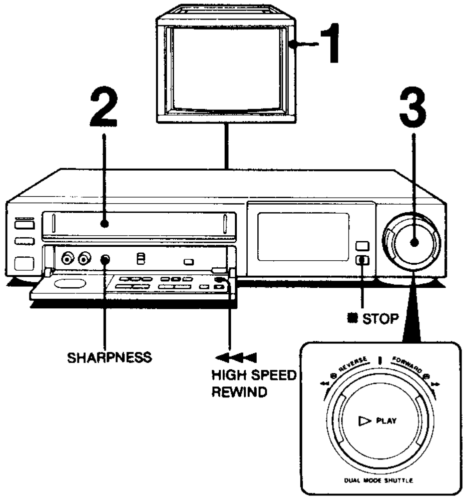
2 Call up the TUNER PRESET menu.

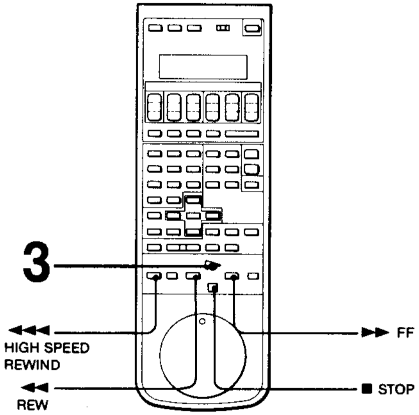
3 Move cursor to FINE TUNING.
The fine tuning meter appears.

4 Press ◀ or ▶ to obtain the best picture.
When ◀ or ▶ is pressed, the dot will move to AFT OFF automatically and the AFT indicator in the display window will be turned off.

5 Press EXECUTE to store that position and return to the original screen.

Playback





Playing a Tape

1 Turn on the TV and select the programme position for the VTR.
If VTR-TV connection is made via EURO-AV, select the input for the VTR.

2 Insert a cassette.
The VTR will be turned on. If your cassette has its safety tab removed, playback starts automatically.

3 Press ▷.
Playback starts.
The VTR automatically rewinds the tape when it reaches the end.

To stop playback
Press ■ STOP.

To advance the tape rapidly
Turn the DUAL MODE SHUTTLE ring clockwise (▶▶), or press ▶▶ FF on the Commander during stop mode.

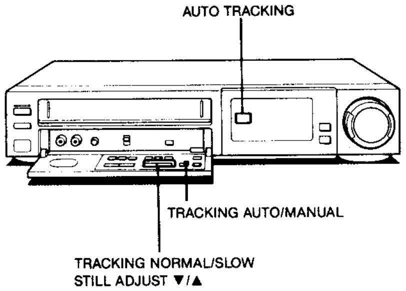
To rewind the tape
Turn the DUAL MODE SHUTTLE ring counterclockwise (◀◀), or press ◀◀ REW on the Commander during stop mode.

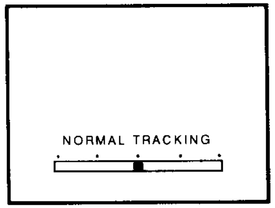
To rewind the tape at high speed
Press ◀◀◀ HIGH SPEED REWIND.

To get a sharper picture
Turn the SHARPNESS control toward SHARP.

To get a softer picture
Turn the SHARPNESS control toward SOFT.

When the tape is played back to the end
The tape will be automatically rewound to the beginning (auto rewind). The power will remain on.





Picture Adjustments

■ Auto tracking function

The tracking condition is automatically adjusted on this VTR. The AUTO TRACKING indicator blinks while the VTR is searching for the best tracking condition and lights when maximum playback picture is obtained. The automatic tracking control is activated in the following conditions:

- — when the cassette is inserted and played back.
- — when the recording mode on the playback tape is switched between SP and LP.
- — when the picture is distorted by scratches etc. on the tape.
- — when the AUTO TRACKING indicator is turned on by pressing TRACKING AUTO/MANUAL after the picture is adjusted manually. (See below.)

■ Manual adjustment during normal playback

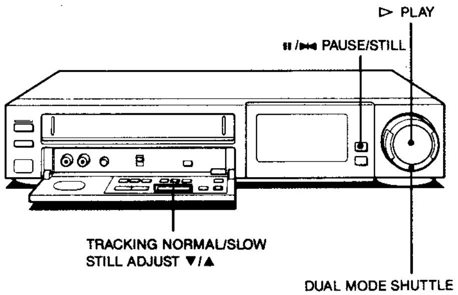
If streaks or snow appear, adjust the picture using the TRACKING NORMAL/SLOW and STILL ADJUST ▼/▲.

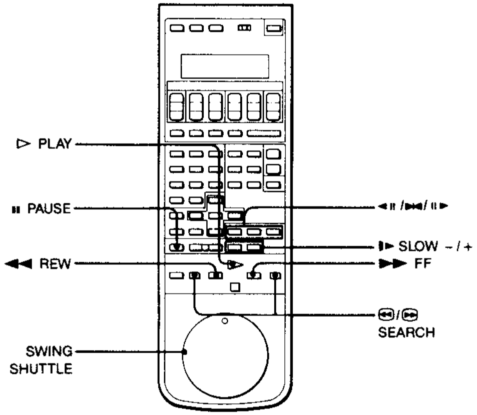
Press either ▼ or ▲ to obtain the best possible picture.
The tracking meter will appear on the TV screen and the AUTO TRACKING indicator will be turned off.

Notes on Automatic Tracking

- •When the manual adjustment proves unsatisfactory, press both of the TRACKING NORMAL/SLOW and STILL ADJUST ▼/▲. The tracking condition will return to the center position.
- •Tracking adjustment may not be possible when the recording condition of the tape is very poor.

Playback





Various Playback Modes

■To obtain a still picture

During playback mode press II/▶◀ PAUSE/STILL on the unit or II PAUSE or ▶◀ on the Commander. To resume normal playback, press ▷ PLAY, II/▶◀ PAUSE/STILL, or II PAUSE. When the pause mode lasts for more than 5 minutes, the unit will re-enter the playback mode automatically.

■To search for a particular scene — Picture search

During playback mode, press ◀◀ REW or ▶▶ FF.
While the button is pressed, a high speed picture without sound will appear on the TV screen. When the button is released, the unit will return to the previous mode.

■To watch the picture during fast-forward or rewind mode — Locked picture search

During the playback mode, press ⏪ SEARCH or ⏩ SEARCH on the Commander. A high speed picture in forward or reverse will appear on the screen even when the button is released. To resume normal playback, press ▷ PLAY.

■To watch slow motion playback

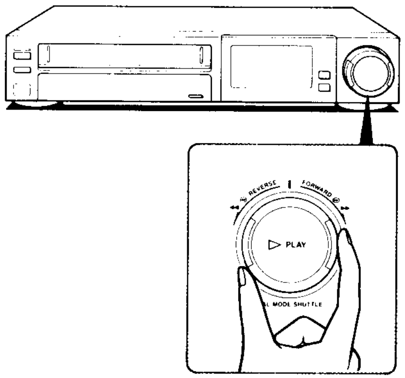
During plabyack or still mode, press I▶ SLOW on the Commander. Change the slow motion speed with the + or – buttons. Press + to increase the playback speed, and – to decrease the playback speed.

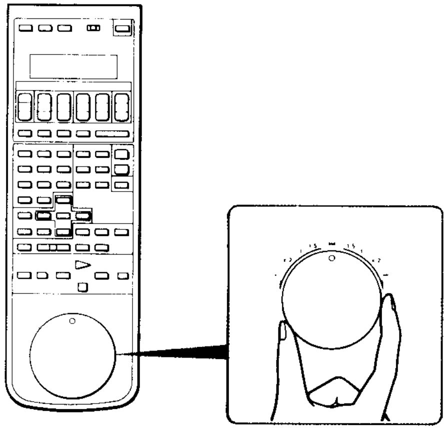
■To see the picture momentarily while the unit is in the fast-forward or rewind mode without picture on the TV screen

During fast-forward, turn the DUAL MODE SHUTTLE ring clockwise (▶▶) or press ▶▶ FF on the Commander. During rewind, turn the DUAL MODE SHUTTLE ring counterclockwise (◀◀) or press ◀◀ REW on the Commander. The high speed playback picture can be seen as long as the ring is held in that position, or the button is pressed. Release the ring or button to return to the previous mode.

■To watch a frame-by-frame picture

During still mode, press II▶ to advance the picture one frame. Press ◀II to reverse the picture one frame. Each press of ◀II / II▶ will move the picture one frame. Press ▷ PLAY to resume normal playback.





■To watch reverse direction playback, and slow picture

During forward playback of the desired mode, press < on the Commander. Press ▷ PLAY or > to resume forward playback.

To eliminate streaks or noise bands during slow motion play
Adjust the picture with TRACKING NORMAL/SLOW and STILL ADJUST ▼/▲ inside the front panel. The picture can be adjusted easily in faster speed playback.

To eliminate the bands on the top or bottom of the screen in still mode
Change to the slow motion play mode and adjust the picture with TRACKING NORMAL/SLOW and STILL ADJUST ▼/▲.

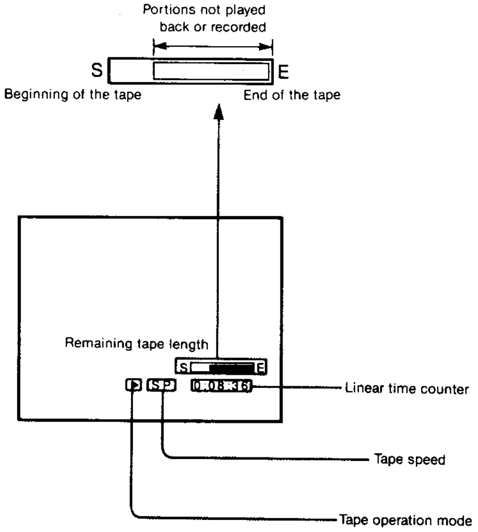
To eliminate picture shaking during still mode
Adjust the picture with TRACKING NORMAL/SLOW and STILL ADJUST ▼/▲ inside the front panel.

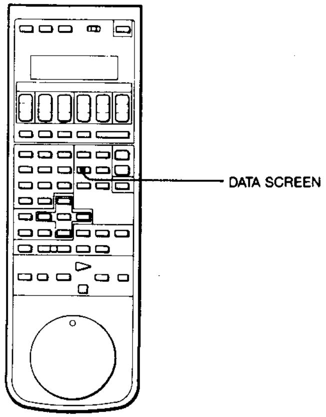
Notes on picture search
The picture may turn to a monochrome picture during picture search when playing back tapes recorded in LP mode depending upon the condition of the connected TV.

■To enjoy various playback modes by the DUAL MODE SHUTTLE ring or the SWING SHUTTLE dial

Various playback modes as illustrated can be selected with DUAL MODE SHUTTLE ring on the unit or the SWING SHUTTLE dial on the Commander from any playback mode. The same speed is available in the reverse direction.
Turn the ring or the dial and hold it at the position where the desired playback speed is obtained.
When you release the ring or the dial, the picture will freeze.
To resume normal playback, press ▷ PLAY.

Playback


Portions not played back or recorded
S
E
Beginning of the tape
End of the tape
Remaining tape length
S
E
SP
0:08:36
Linear time counter
Tape speed
Tape operation mode


DATA SCREEN

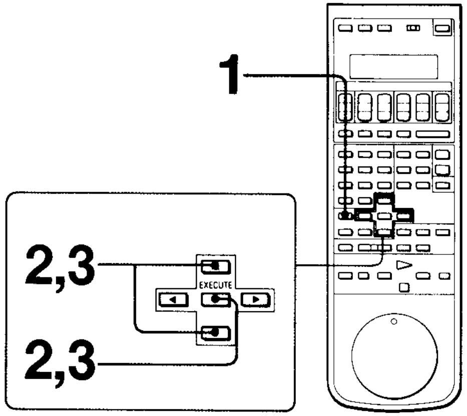
Data Screen

Data screen information illustrated on the left will automatically appear on the screen during playback or recording as a reference. Note, however, that the data screen will not be displayed when the VTR is in slow motion or playback pause mode.

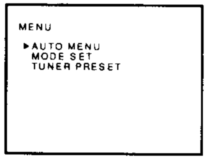
■To erase or display the data screen
Press DATA SCREEN.

Notes on the remaining tape length indicator

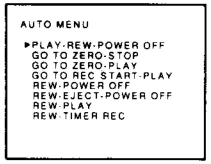
- The remaining tape length indicator only shows the approximate amount of tape left.
- The indication may shift vertically during the fast-forward or rewind mode.
- It may not operate properly when a short tape, such as the E-30 and VHS-C type cassette, or when a non-standardized tape is inserted.


1
2,3
2,3
EXECUTE

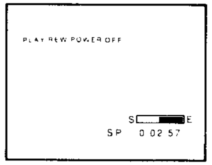
1


MENU
▸AUTO MENU
MODE SET
TUNER PRESET

2


AUTO MENU
▸PLAY·REW·POWER OFF
GO TO ZERO·STOP
GO TO ZERO·PLAY
GO TO REC START·PLAY
REW·POWER OFF
REW·EJECT·POWER OFF
REW·PLAY
REW·TIMER REC

3


PLAY·REW·POWER OFF
S
E
SP 0 02 57

Assigning a Desired Operation Mode

Guided by the AUTO MENU, you can make the VTR enter the desired operational sequence automatically.

1 Press MENU while the VTR is in the stop mode.
The main MENU appears.

2 Move cursor with ▲ or ▼ to AUTO MENU and press EXECUTE.
The AUTO MENU appears.

3 Move cursor with ▲ or ▼ to the desired operational sequence and press EXECUTE.
The selected operation will begin.

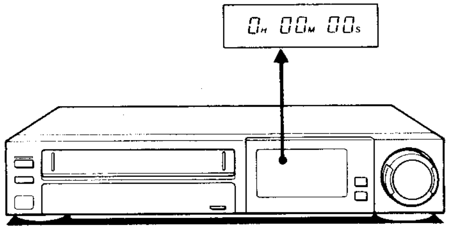
The selected operating mode will be superimposed on the TV screen for a few seconds. The AUTO indicator will light in the display window during AUTO MENU operation.

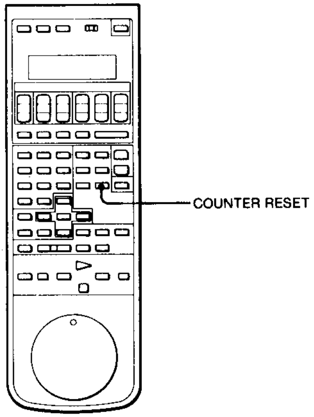
Notes on AUTO MENU operation
AUTO MENU cannot be operated if there is no cassette installed or if the VTR is in modes other than stop mode. A short beep alerts you if the AUTO MENU is not operable.

Note on "GO TO REC START-PLAY"
The recording start point data will be erased from the memory after the following operations and "GO TO REC START-PLAY" will not be operable.

- When COUNTER RESET is pressed.
- When cassette is ejected and re-inserted.
- When HIGH SPEED REWIND is pressed.

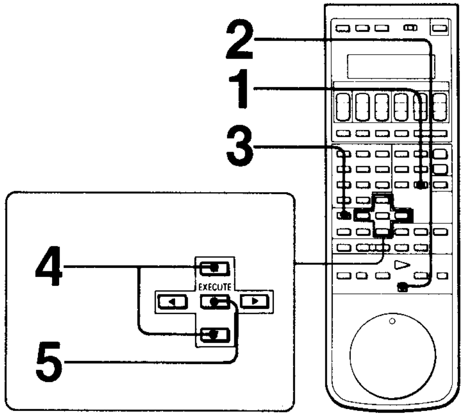
Use of the Tape Counter





Understanding Counter Zero Position

The tape counter on this VTR can be used as a reference when you wish to locate a certain scene after recording or playback. Press COUNTER RESET to set the counter to "0H00M00S" (counter zero position) before operation. The VTR will keep counting the length of tape being played back or recorded. Note, however, that the tape counter will not count the portions of tape with no signals recorded. This VTR automatically resets the counter to zero whenever a cassette is inserted. Two additional features using COUNTER RESET are available on this VTR.



Tape Return

The VTR can search for the counter zero position and stop. This function is useful for locating a particular scene after recording or playback.

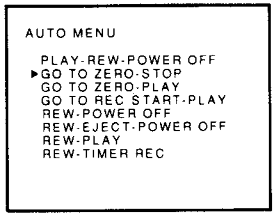
1 Press COUNTER RESET at the desired scene during recording or playback.

2 Press ■ to stop recording or playback.

3 Press MENU and select AUTO MENU.
See "Assigning a Desired Operation Mode" for operation.

4 Move cursor to "GO TO ZERO-STOP."

5 Press EXECUTE.



```
AUTO MENU

  PLAY-REW-POWER OFF
 ▶GO TO ZERO-STOP
  GO TO ZERO-PLAY
  GO TO REC START-PLAY
  REW-POWER OFF
  REW-EJECT-POWER OFF
  REW-PLAY
  REW-TIMER REC
```

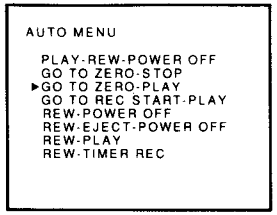
Tape Return Play

The VTR will even search and start playback from the counter zero position after recording or playback.

1 Repeat steps 1 to 3 in the Tape Return operation.

2 Move cursor to "GO TO ZERO-PLAY"

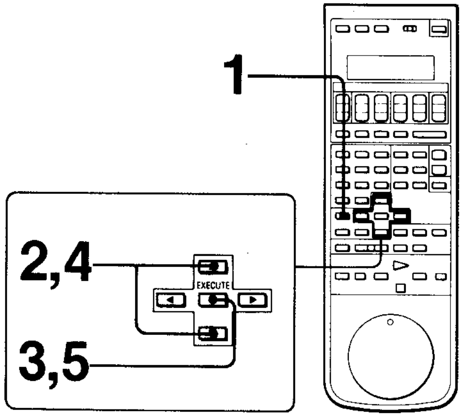
3 Press EXECUTE.



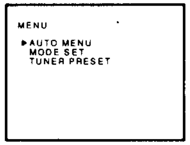
```
AUTO MENU

  PLAY-REW-POWER OFF
  GO TO ZERO-STOP
 ▶GO TO ZERO-PLAY
  GO TO REC START-PLAY
  REW-POWER OFF
  REW-EJECT-POWER OFF
  REW-PLAY
  REW-TIMER REC
```

Timer Activated Recording


1
2,4
3,5
EXECUTE

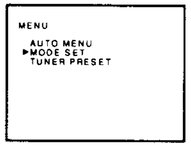
1



```
MENU

▶AUTO MENU
 MODE SET
 TUNER PRESET
```

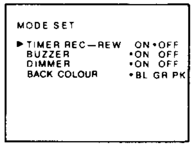
2



```
MENU

 AUTO MENU
▶MODE SET
 TUNER PRESET
```

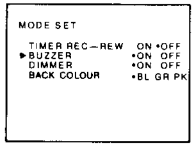
3



```
MODE SET

▶TIMER REC—REW   ON •OFF
 BUZZER         •ON  OFF
 DIMMER         •ON  OFF
 BACK COLOUR    •BL GR PK
```

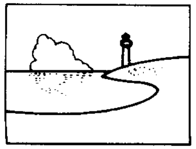
4



```
MODE SET

 TIMER REC—REW   ON •OFF
▶BUZZER         •ON  OFF
 DIMMER         •ON  OFF
 BACK COLOUR    •BL GR PK
```

5



Timer Recording on this VTR

Up to eight preselected programmes, can be set on this unit, up to one month in advance.

Before You Begin

- Turn on the TV and adjust it to view the VTR output.
- Check to see that the clock on the Commander and the VTR shows the present time.
- To operate the SLV-373VP, read "VPS Function" first.

To Turn On/Off the Warning Buzzer

It is possible to turn on or off the beep sound which this VTR will give whenever an illogical operation command is sent from the Commander.

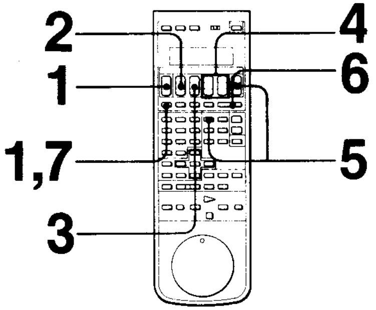
1 **Press MENU in the stop mode.**
The main MENU appears.

2 **Move cursor with ▲ or ▼ to MODE SET.**

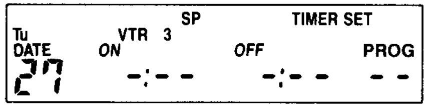
3 **Press EXECUTE.**
The MODE SET menu appears.

4 **Move cursor with ▲ or ▼ to BUZZER.**
Select ON to activate and OFF to deactivate the buzzer by ◀ or ▶.

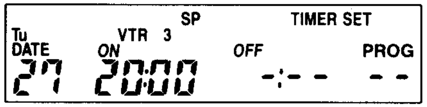
5 **Press EXECUTE to store the setting and return to the original screen.**



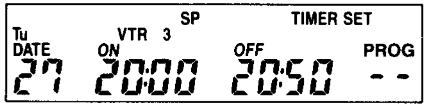
1


SP
TIMER SET
Tu
VTR 3
DATE
ON
OFF
PROG
27
-:--
-:--
--

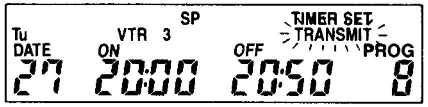
2,3


SP
TIMER SET
Tu
VTR 3
DATE
ON
OFF
PROG
27
20:00
-:--
--

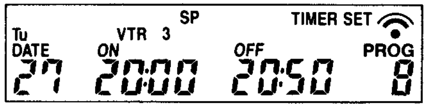
4


SP
TIMER SET
Tu
VTR 3
DATE
ON
OFF
PROG
27
20:00
20:50
--

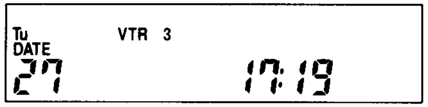
5


SP
TIMER SET
TRANSMIT
Tu
VTR 3
DATE
ON
OFF
PROG
27
20:00
20:50
8

6


SP
TIMER SET
Tu
VTR 3
DATE
ON
OFF
PROG
27
20:00
20:50
8

7


Tu
VTR 3
DATE
27
17:19

Operation

Example: To record a programme broadcast from 20:00 to 20:50 on Tuesday, November 27, 1990 on programme position 8.

1 **Press TIMER SET first, then press D until 27 appears.**
The day of the week, Tu (Tuesday), is automatically set.

2 **Set the recording start hour with TURN ON H.**

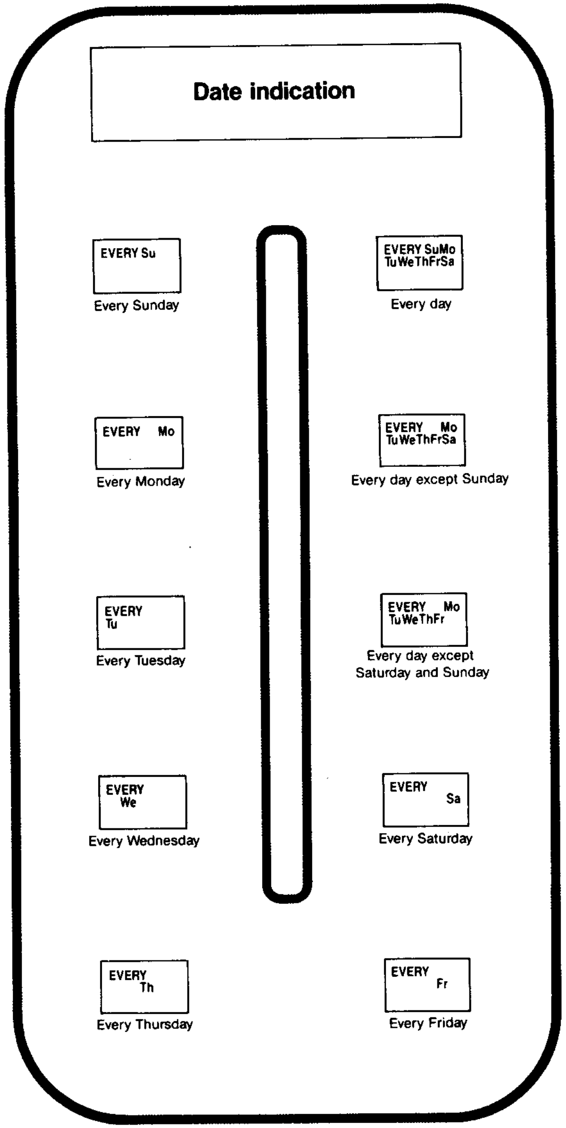
3 **Set the recording start minute with TURN ON M.**

4 **Set the recording end hour and minute with TURN OFF H and M referring to step 2 and 3.**

5 **Set the programme position with the PROG +/– button. To select the recording speed LP, press REC MODE so that the LP indicator appears in the display.**
The TRANSMIT indicator blinks to indicate that all of the items are entered.

6 **Point the Commander to the VTR and press TRANSMIT.**
With a beep sound, the VTR enters the timer recording standby mode. The PROGRAM LIST appears on the screen for a few seconds.

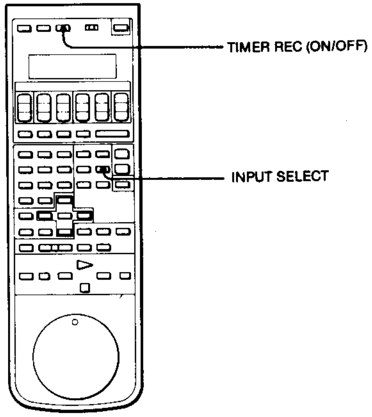
7 **Press TIMER SET so that the present time appears on the LCD display.**
The VTR turns on, starts recording at the selected time, and turns off after recording ends.


Date indication
EVERY Su
Every Sunday
EVERY SuMo TuWeThFrSa
Every day
EVERY Mo
Every Monday
EVERY Mo TuWeThFrSa
Every day except Sunday
EVERY Tu
Every Tuesday
EVERY Mo TuWeThFr
Every day except Saturday and Sunday
EVERY We
Every Wednesday
EVERY Sa
Every Saturday
EVERY Th
Every Thursday
EVERY Fr
Every Friday

Daily/Weekly Recording

This VTR can be preset to record the same programme each day of the week (daily recording) or the same programme on a specific day of every week.

Press D – on the Commander to change the LCD display in the order shown in the illustration instead of step 1 in the "Operation." When the desired recording mode is set and transmitted to the VTR, the corresponding indicator lights in the display window.


TIMER REC (ON/OFF)
INPUT SELECT

To Set Other Programmes

Repeat steps **1** to **6** in "Operation" before step **7**.

To Stop Timer Recording

Press TIMER REC ON/OFF.

To Record from Equipment Connected to EURO-AV or LINE IN 2 VIDEO/AUDIO Jacks

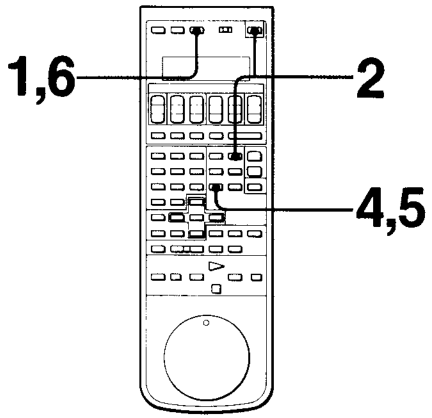
Press INPUT SELECT anytime in step **1** to **5** to change the indication from PROG – – to LINE L1 to LINE L2.

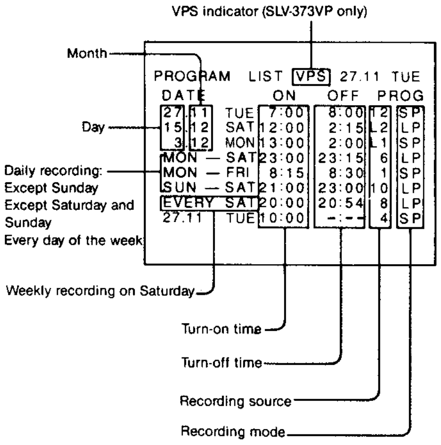
If a short beep sounds repeatedly when TRANSMIT is pressed
When BUZZER ON is selected in the MODE SET menu, the short beep indicates that the transmission is not received on the VTR. Press TRANSMIT again, then check the items below.
- No cassette is inserted.
- An illogical setting has been made.
- Timer setting can only be performed when the VTR is in turned off, stop, or timer recording mode.
- Eight timer settings have already been made.
- The tape is at its end.

If the tape is ejected after pressing TRANSMIT
The safety tab of the inserted cassette is removed.

Understanding "one month"
This VTR sets the timer to record programmes to be broadcast between today and one day before the same date in the next month.

Timer Activated Recording




VPS indicator (SLV-373VP only)
Month
Day
Daily recording:
Except Sunday
Except Saturday and Sunday
Every day of the week
Weekly recording on Saturday
Turn-on time
Turn-off time
Recording source
Recording mode

```
PROGRAM  LIST  VPS  27.11  TUE
 DATE              ON     OFF   PROG
 27.11    TUE  7:00    8:00  12  SP
 15.12    SAT 12:00    2:15  L2  LP
  3.12    MON 13:00    2:00  L1  SP
 MON — SAT    23:00   23:15   6  LP
 MON — FRI     8:15    8:30   1  SP
 SUN — SAT    21:00   23:00  10  LP
 EVERY  SAT   20:00   20:54   8  LP
 27.11    TUE 10:00   -:--    4  SP
```

Checking the Timer Settings

The timer settings can be checked while the VTR is in the timer standby mode by displaying the programme list on the screen.

1 **Press TIMER REC ON/OFF to turn off the TIMER REC ON/OFF indicator in the display window.**

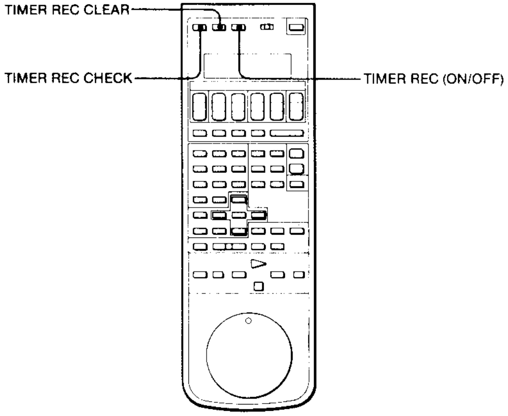
2 **Turn on the VTR and press TV/VTR to light the VTR indicator. (Only when connection is made via EURO-AV.)**

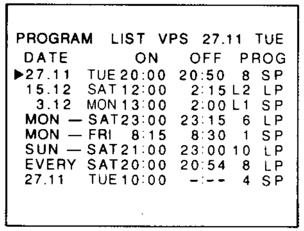
3 **Turn on the TV.**
Set to the programme position for VTR if VTR-TV connection is made via the aerial sockets. Select VTR input on the TV if VTR-TV connection is made via EURO-AV.

4 **Press TIMER ON SCREEN.**
The programme list appears.

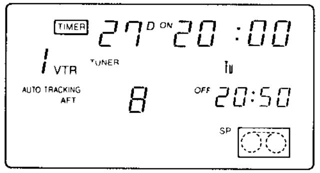
5 **Press TIMER ON SCREEN again to return to the original screen.**

6 **Press TIMER REC ON/OFF to return to the timer recording standby mode.**


TIMER REC CLEAR
TIMER REC CHECK
TIMER REC (ON/OFF)



```
PROGRAM  LIST  VPS  27.11  TUE
 DATE           ON     OFF   PROG
▶27.11   TUE 20:00   20:50   8  SP
 15.12   SAT 12:00    2:15  L2  LP
  3.12   MON 13:00    2:00  L1  SP
 MON — SAT 23:00     23:15   6  LP
 MON — FRI  8:15      8:30   1  SP
 SUN — SAT 21:00     23:00  10  LP
 EVERY SAT 20:00     20:54   8  LP
 27.11   TUE 10:00   -:--    4  SP
```


TIMER
27 D ON 20 :00
1 VTR
TUNER
TV
AUTO TRACKING
AFT
8
OFF 20:50
SP

Clearing/Correcting the Timer Setting

■Referring to the programme list

1 **Display the programme list referring to steps 1 to 4 in "Checking the Timer Settings."**

2 **Press TIMER REC CHECK to call up and move cursor to the setting you want to correct or clear.**

3 **To clear the setting, press TIMER REC CLEAR.**
If there are other timer settings on the list, press TIMER REC ON/OFF return to the timer recording standby mode.
To correct the setting, re-enter all of the items using the Commander. Refer to "Timer Activated Recording — Operation" steps 1 to 6.
The VTR automatically enters the timer recording standby mode.

■Clearing the setting without the programme list

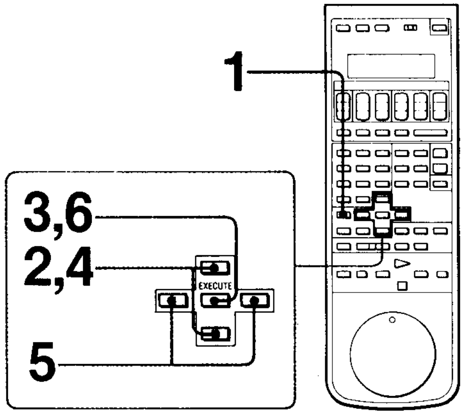
1 **Press TIMER REC ON/OFF.**

2 **Press TIMER REC CHECK repeatedly until the desired programme appears in the display window.**

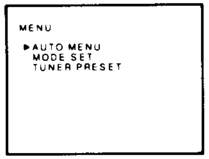
3 **Press TIMER REC CLEAR.**

4 **Press TIMER REC ON/OFF to return to the timer recording standby mode if there are other programmes set for timer recording.**

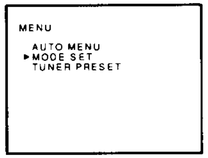
Timer Activated Recording


1
3,6
2,4
5
EXECUTE

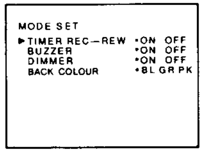
1


MENU
▶AUTO MENU
MODE SET
TUNER PRESET

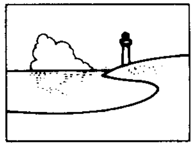
2


MENU
AUTO MENU
▶MODE SET
TUNER PRESET

3,4,5


MODE SET
▶TIMER REC—REW •ON OFF
BUZZER •ON OFF
DIMMER •ON OFF
BACK COLOUR •BL GR PK

6



To Automatically Rewind the Tape After Timer Recording

1 **Before setting the timer, press MENU.**

2 **Move cursor with ▲ or ▼ to MODE SET in the main menu.**

3 **Press EXECUTE.**

4 **Move cursor with ▲ or ▼ to TIMER REC-REW.**

5 **Press ◀ or ▶ to move the dot to ON.**
To cancel this setting, move the dot to OFF.

6 **Press EXECUTE to store this setting and return to the original screen.**

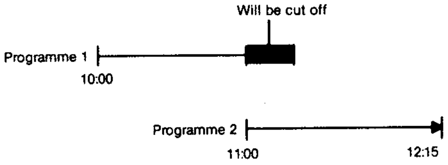
Using the VTR during Timer Recording Standby Mode

1 **Press TIMER REC ON/OFF to turn off the TIMER REC indicator.**

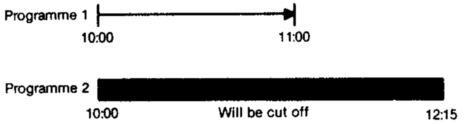
2 **Turn on the power of the VTR.**
The VTR is ready to be used.

3 **After using the VTR, press TIMER REC ON/OFF and light the TIMER indicator to re-enter the timer recording standby mode.**

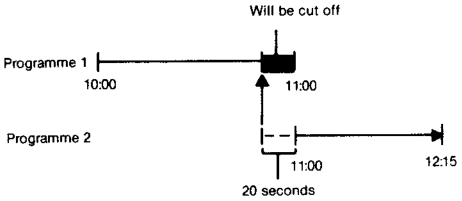
When the Timer Settings Overlap


Will be cut off
Programme 1
10:00
Programme 2
11:00
12:15

■If the setting of two programmes overlap
The recording of the following programme will begin automatically before the proceeding programme ends.


Programme 1
10:00
11:00
Programme 2
10:00
Will be cut off
12:15

■If the turn on time of two programmes are the same
The VTR will record the programme with the smaller programme number or listed first on the programme list. The programme with the larger programme number or listed lower in the list will be erased.

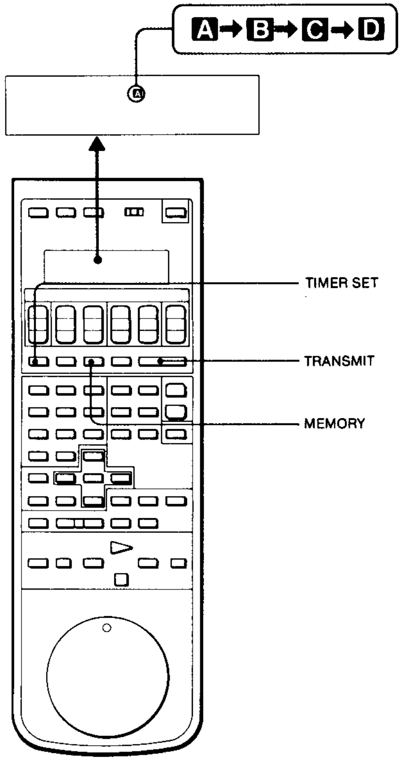

Will be cut off
Programme 1
10:00
11:00
Programme 2
11:00
12:15
20 seconds

■If the recording end time of programme 1 and the recording start time of programme 2 are the same
The last 20 seconds of programme 1 will not be recorded because the VTR will enter the recording pause mode for programme 2 before programme 1 ends.

Power interruption during timer recording standby/timer recording mode

- •If the power interruption lasts less than an hour, the VTR will enter the recording standby mode or resume timer recording when the power is recovered.
- •If the power interruption exceeds an hour during the recording standby mode, the timer settings will be cleared.
Reset the clock and re-enter the items for timer recording again. If the power interruption occurred during timer recording, the recording will stop and the VTR will be turned off.

Timer Activated Recording



To Store the Frequently Used Timer Settings in the Commander

The items selected for one timer recording programme will be erased from the LCD when TIMER SET is pressed, and cleared from the programme list as well when recording is over.
However, the turn-on/turn-off time and the programme position of up to four programmes can be stored in the Commander to be recalled later. This enables you to quickly access the most frequently used items, especially your favorite weekly programme, since the recording date will automatically be shifted to the next week after the recording is over.

■Storing the parameters

1 **Press TIMER SET and MEMORY to indicate MEMORY A.**

2 **Set all of the items for timer recording referring to "Timer Activated Recording — Operation."**

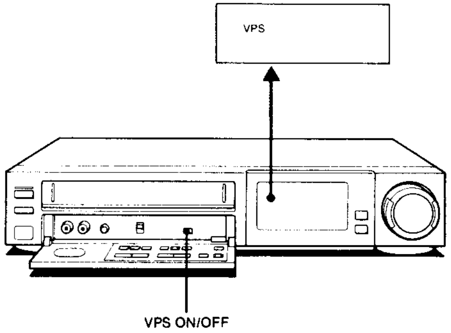
3 **Press MEMORY to change the indication to B, C, or D, and repeat step 2 for other programmes.**
The items set will be kept in the memory even when TIMER SET is pressed.

■Recalling and re-entering the items

1 **Press TIMER SET and MEMORY to call up the desired memory indication (A, B, C, or D).**

2 **Make whatever changes necessary.**

3 **Press TRANSMIT.**
The VTR enters the timer recording standby mode.



VPS (Video Programme System) Function (SLV-373VP only)

The German broadcasting system transmits VPS signals with the TV programmes which assures that your timer recording will be performed without missing any portion of it regardless of any earliness, time delay, extension, or broadcast interruption which might occur during that programme.

■Operation

1 **Check whether VPS is transmitted with the programme to be recorded.**

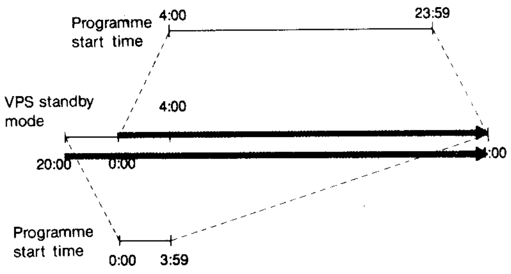
2 **Press VPS ON/OFF so that the VPS indicator lights in the display window.**

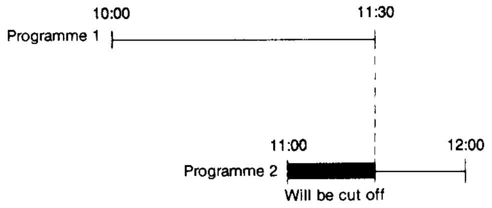
3 **Set the timer referring to "Timer Activated Recording — Operation."**

Notes

- The VPS button is effective only when the TIMER REC ON/OFF indicator is turned off.
- If the VPS signal was not received on the VTR because it was too weak or because the station failed to transmit, timer recording will be performed without the VPS function regardless of the VPS indication.
- The recording will stop when the VTR receives a VPS programme interruption code during recording, for example, when an urgent news bulletin was inserted. As soon as the interrupted programme resumes, recording will continue.

Timer Activated Recording





■VPS standby mode
The VTR will enter the standby mode for VPS recording far before the turn on time and remains in the standby mode passed the preset turn on time until the VPS signal is received to prepare for any change in the actual broadcast time.

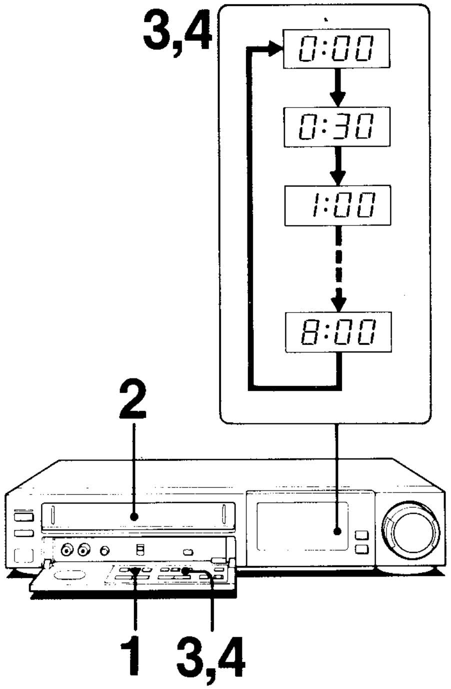
When the VPS timer recording is set for a programme which is expected to start between 4:00 and 23:59, the VTR will enter the standby mode at 0:00 that day and will keep on waiting for the VPS signal until 4:00 of the next day.

When the VPS timer recording is set for a programme which is expected to start between 0:00 and 3:59, the VTR will enter the standby mode at 20:00 the day before the recording day and will keep on waiting for the VPS signal until 4:00 on the recording day.

Note
When the VTR is in the VPS standby mode, programme position numbers set for timer recording appear in the display window sequentially by few seconds.

■If the actual recording time overlaps with the next timer recording programme
There may be cases when the actual broadcast time of two timer recording programmes overlap owing to the shift made by the VPS signal. In this case, the programme that was broadcast first always has priority. The recording of the second programme will begin only after the first programme is over.

Quick Timer Recording



What is Quick Timer Recording?

The quick timer recording function provides a short cut to enter the timer recording mode or to use the timer to turn off the VTR after recording is over. The timer can be set to operate within 8 hours in units of 30 minutes.

Operation

If you are recording, skip steps 1 to 3.

1 **Press INPUT SELECT so that TUNER indicator is turned on.**

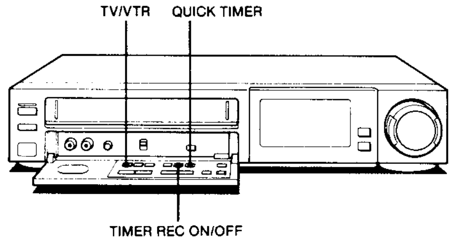
2 **Insert a cassette.**

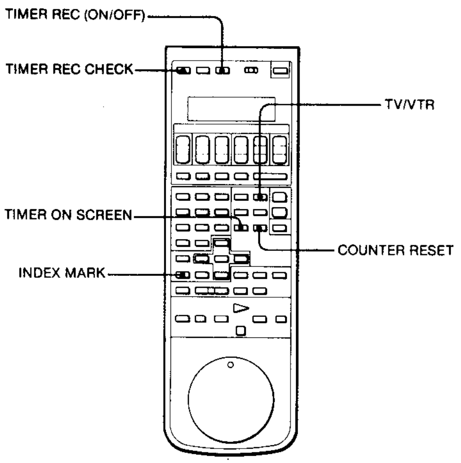
3 **Press QUICK TIMER.**
TIMER indicator lights in the display window. While 0:00 and programme position number is blinking in the display window, select the desired programme number with PROGRAM +/–.
A cassette with its safety tab removed will be ejected.

4 **Press QUICK TIMER again to start recording.**
Press QUICK TIMER again to set the recording duration within 30 seconds from step 3, otherwise the power will be turned off. Each press of QUICK TIMER changes the indication in the display window in units of 30 minutes.

5 **The recording duration will decrease minute by minute until 0:00 when the VTR will be automatically turned off.**

Quick Timer Recording





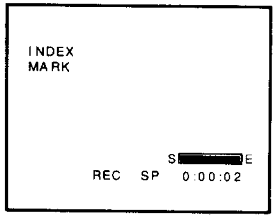
■ Buttons operable during quick timer recording

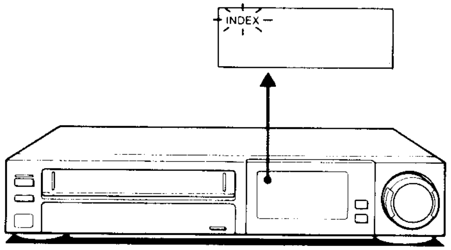
- **•TIMER REC ON/OFF** stops quick timer recording.
- **•QUICK TIMER** changes the recording duration.
- **•TIMER ON SCREEN** displays the programme list.
- **•TIMER REC CHECK** changes the programme number in the display window.
- **•COUNTER RESET** resets the counter to zero.
- **•INDEX MARK** marks an index signal.
- **•TV/VTR** switches the screen to another programme received on the TV.

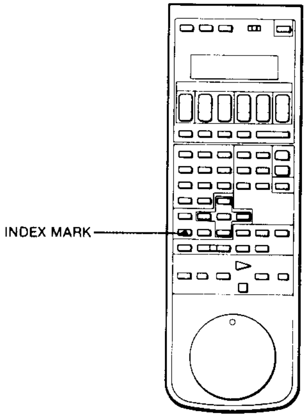
If power interruption occurs during quick timer recording
Recording will stop and the VTR will be turned off. If the power interruption lasted for less than one hour and if the power recovered within the quick timer duration, recording will resume from that instant.

If the unit is in timer recording standby mode
Press TIMER REC ON/OFF to turn off the indicator, then follow steps **4** and **5**.

Index Function







Marking Index Signals

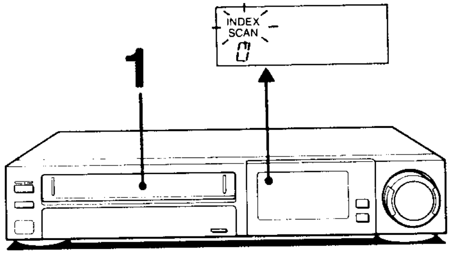
The desired position on a tape can be located easily by detecting the index signals. There are two ways in which to mark index signals: automatic and manual. When the index signal is being marked, INDEX flashes in the display window and the INDEX MARK display will appear on the screen.

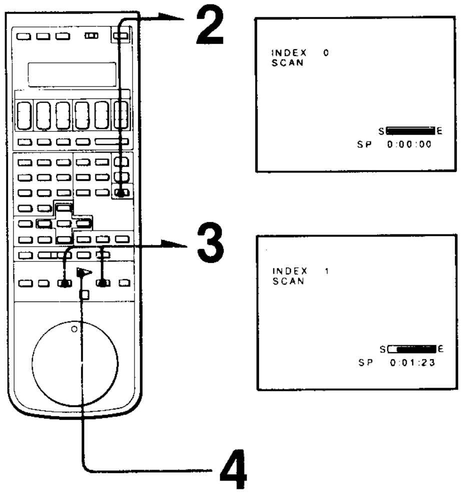
■ Automatic index mark
An index signal is automatically marked on the tape when the VTR starts recording.

■ Manual index mark
Index signals can be marked at desired scenes. Press INDEX MARK to mark an index.

Notes
- •Leave an interval of more than 2-minute interval between two index points so that the VTR can detect each INDEX signal accurately.
- •The recorded sound will not be heard while marking an index signal. But the signal will not be erased.
- •Index signals cannot be marked on a tape whose safety tab is removed or on an unrecorded portion of the tape.

Index Function


1
INDEX
SCAN
0


2
INDEX 0
SCAN
S E
SP 0:00:00
3
INDEX 1
SCAN
S E
SP 0:01:23
4

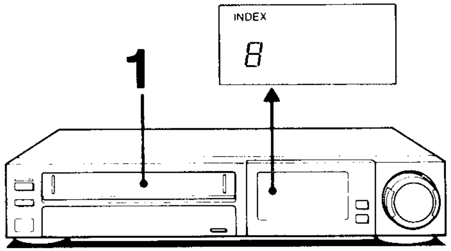
Playing Back from the Index Point — INDEX SCAN

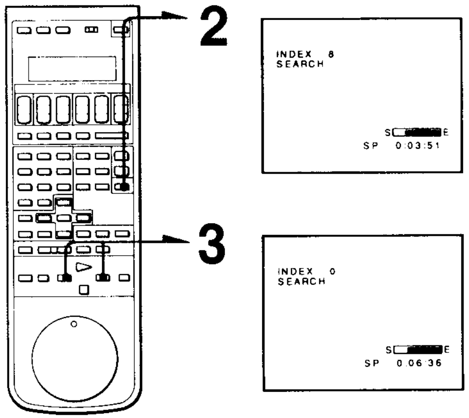
1 Insert a cassette with index signals.

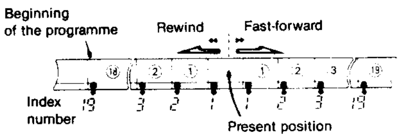
2 Press INDEX once.
INDEX or SCAN indicator blinks alternately and 0 (zero) lights in the display window.

3 Press ◀◀ to playback from the previous programme.
Press ▶▶ to playback from the programme ahead.
The VTR will advance to the next or previous index signal. Then the VTR will play the tape for approximately 10 seconds, and then move to the next index in the selected direction. The index number changes one by one.

4 Press ▷ when the desired index signal is detected.




2
INDEX 8
SEARCH
S E
SP 0:03:51
3
INDEX 0
SEARCH
S E
SP 0:06:36


Beginning of the programme
Rewind
Fast-forward
Index number
19
3
2
1
1
2
3
19
18
2
1
1
2
3
19
Present position

Locating an Index — INDEX SEARCH

Direct search of the desired index point can be performed by entering the number of how many indexes ahead or behind it is from the current tape position. The VTR counts down how may more indexes should be searched for and displays the sequence in the display window. Up to 19 indexes from the present position can be searched.

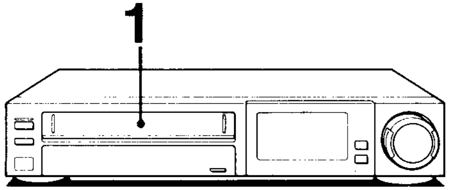
1 Insert a cassette with index signals.

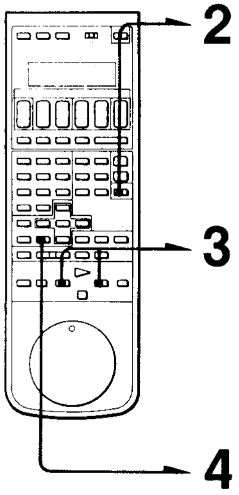
2 Press INDEX to show how many indexes should be counted to reach the desired scene.

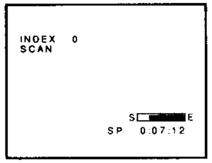
3 Press ◀◀ if the index is behind or ▶▶ if the index is ahead of the current tape position.
The VTR starts searching and the index number will be counted down to zero.

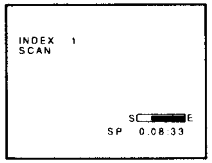
Playback from the desired point starts.

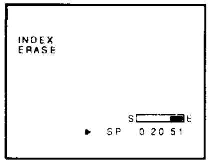
Index Function






INDEX 0
SCAN
S E
SP 0:07:12


INDEX 1
SCAN
S E
SP 0:08:33


INDEX
ERASE
S E
▶ SP 0:20:51

Erasing an Index

The index marked on the tape can be erased.

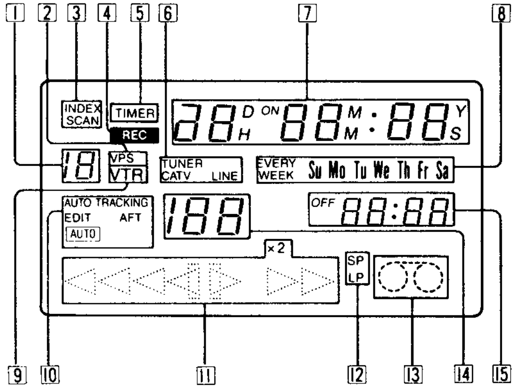
1 **Insert a cassette with index signals.**

2 **Press INDEX once.**

3 **Press ◀◀ or ▶▶ to search for the index signal.**
When the VTR detects an index signal, the VTR will play the tape for approximately 10 seconds from the index. If that is the index you want to erase, go to step **4**. If that is not the index you want to erase, wait until the desired index is searched.

4 **Press INDEX ERASE while the VTR is in step 3.**
That index signal will be erased. While the index signal is being erased, the recorded sound will not be heard, but it will not be erased. If INDEX ERASE is not pressed within the 10 seconds of playback, the VTR will return to step 3.

Indications in the Display Window


1
2
3
4
5
6
7
8
INDEX SCAN
TIMER
REC
D ON
H
M
M
Y
S
VPS
VTR
TUNER
CATV LINE
EVERY WEEK
Su Mo Tu We Th Fr Sa
AUTO TRACKING
EDIT AFT
AUTO
OFF
x2
SP
LP
9
10
11
12
13
14
15

1 Index number indicator

2 VPS indicator (SLV-373VP only)
Appears while timer recording is performed with VPS (Video Programme Ssytem) function.

3 INDEX SCAN indicator
Appears while the VTR is scanning the index point.

4 REC (recording) indicator
Appears while the VTR is performing normal recording, timer recording, or performing quick timer recording.

5 TIMER recording indicator
Appears while the VTR is performing timer-recording, waiting for the turn-on time of timer recording, or performing quick timer recording.

6 Input mode indicators

7 Linear time counter and turn-on time of timer recording

8 Day of the week indicator

9 VTR indicator
Appears while viewing the playback of the VTR or a programme selected on the VTR. As long as this indicator lights in the display window, the programme selected on the TV does not appear on the screen.

10 Various function indicators
AUTO TRACKING (Automatic tracking), EDIT, AFT (Automatic Fine Tuning) and AUTO (AUTO MENU display).

11 Tape operation indicator

12 Tape speed indicator

13 Cassette indicator

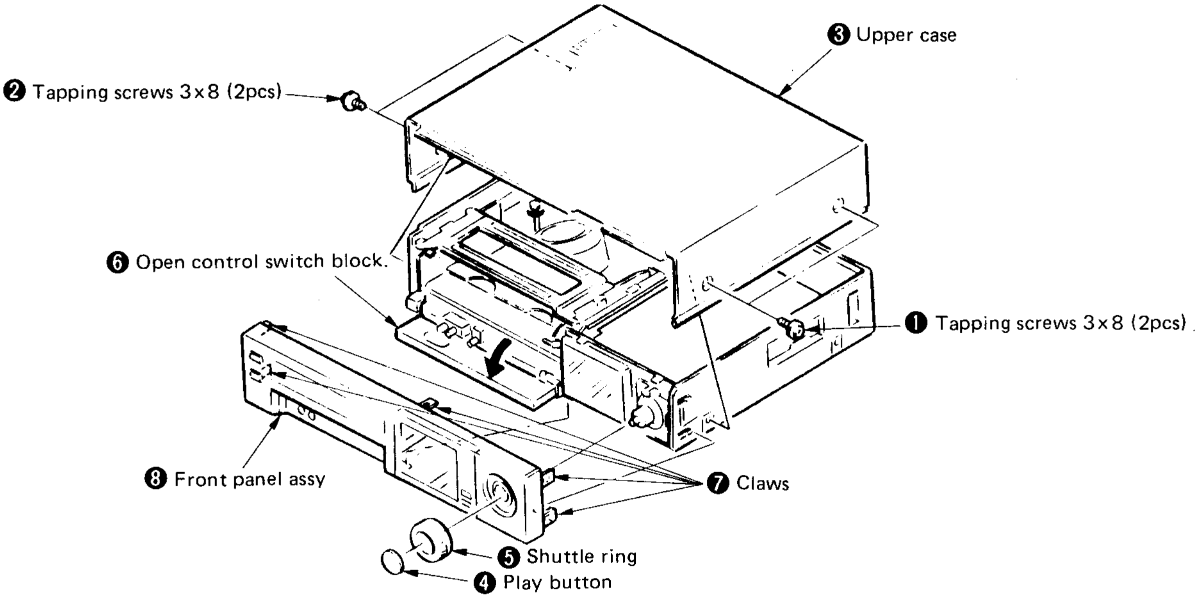
14 Programme position/input mode indicators

15 Current time, turn-off time of timer recording, and quick timer recording time.

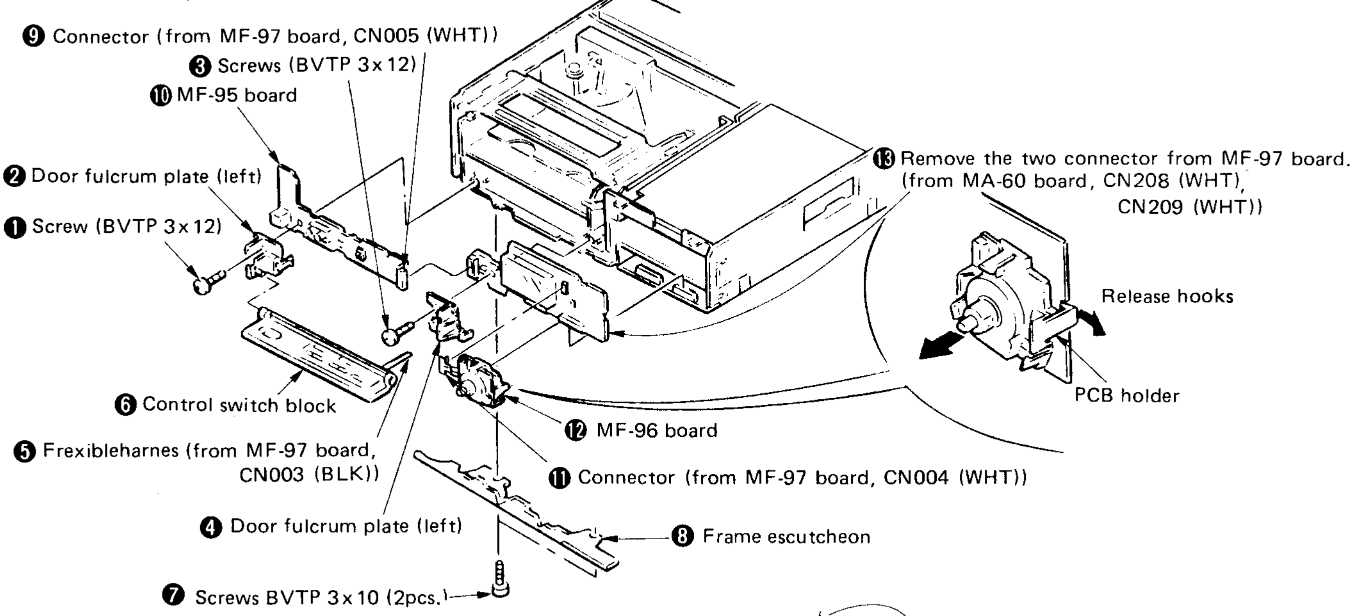
SECTION 2
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

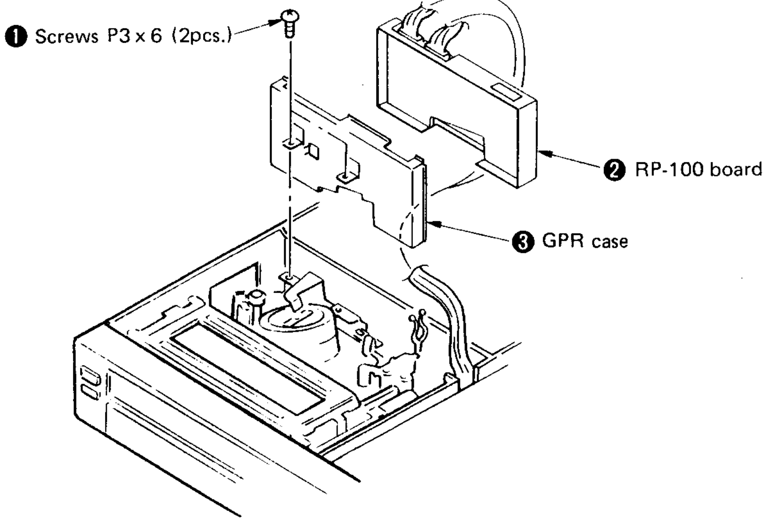
2-1. UPPER CASE, FRONT PANEL ASSY


❸ Upper case
❷ Tapping screws 3x8 (2pcs)
❻ Open control switch block.
❶ Tapping screws 3x8 (2pcs)
❽ Front panel assy
❼ Claws
❺ Shuttle ring
❹ Play button

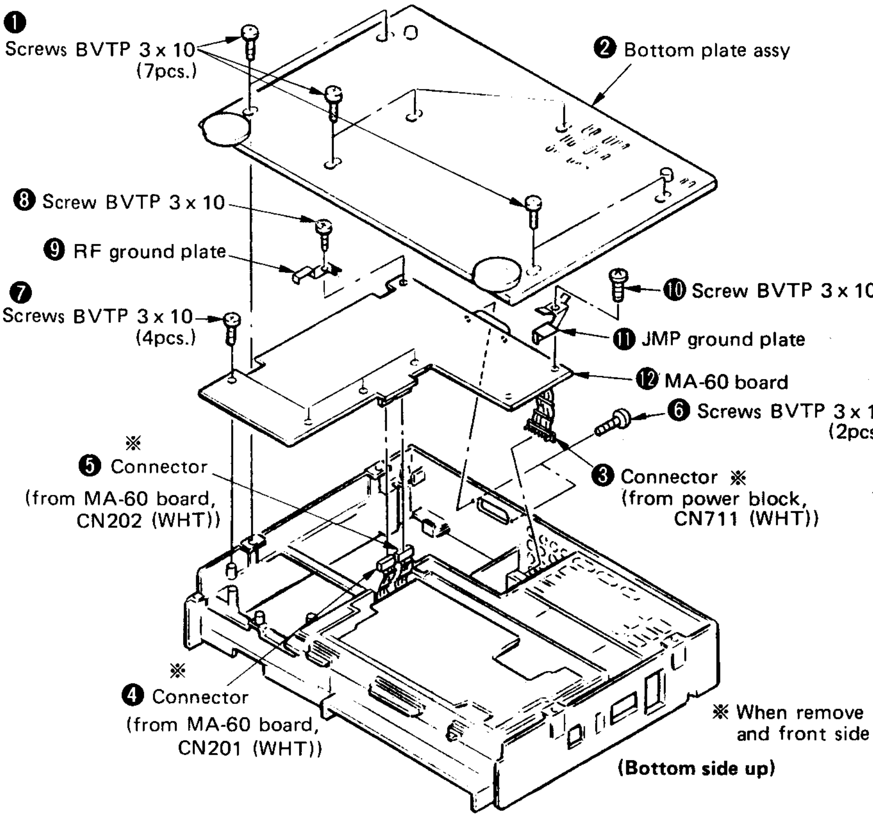
2-2. MF-95, MF-96 AND MF-97 BOARD


❾ Connector (from MF-97 board, CN005 (WHT))
❸ Screws (BVTP 3x12)
❿ MF-95 board
❷ Door fulcrum plate (left)
❶ Screw (BVTP 3x12)
⓭ Remove the two connector from MF-97 board.
(from MA-60 board, CN208 (WHT),
CN209 (WHT))
Release hooks
PCB holder
❻ Control switch block
❺ Frexibleharnes (from MF-97 board,
CN003 (BLK))
⓬ MF-96 board
⓫ Connector (from MF-97 board, CN004 (WHT))
❹ Door fulcrum plate (left)
❽ Frame escutcheon
❼ Screws BVTP 3x10 (2pcs.)

2-3. RP-100 BOARD


❶ Screws P3x6 (2pcs.)
❷ RP-100 board
❸ GPR case

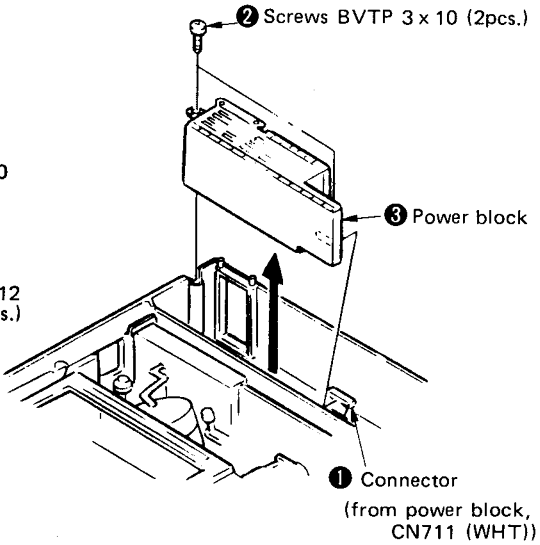
2-4. BOTTOM PLATE, MA-60 BOARD


❶ Screws BVTP 3 x 10 (7pcs.)
❷ Bottom plate assy
❽ Screw BVTP 3 x 10
❾ RF ground plate
❼ Screws BVTP 3 x 10 (4pcs.)
❿ Screw BVTP 3 x 10
⓫ JMP ground plate
⓬ MA-60 board
❻ Screws BVTP 3 x 12 (2pcs.)
※ ❺ Connector (from MA-60 board, CN202 (WHT))
❸ Connector ※ (from power block, CN711 (WHT))
※ ❹ Connector (from MA-60 board, CN201 (WHT))

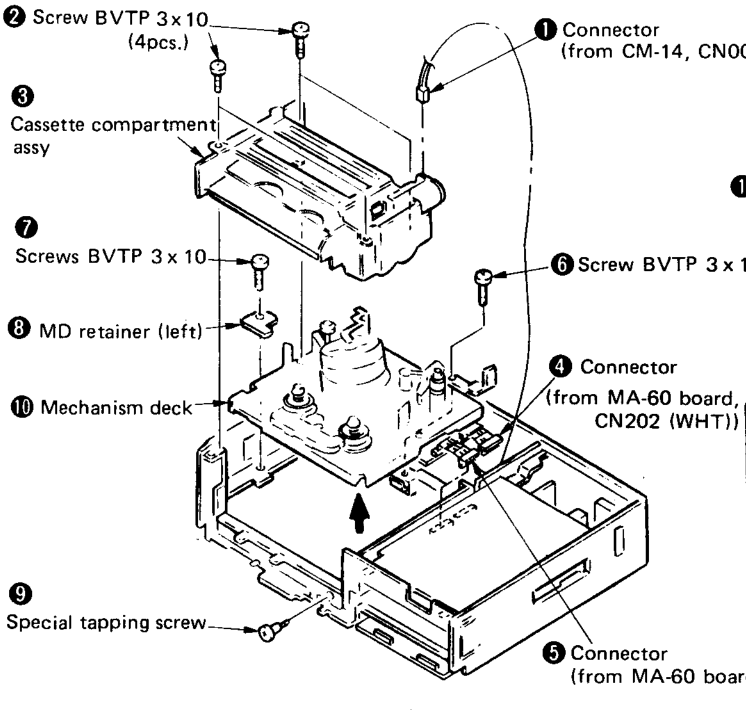
※ When remove the connectors and front side of set at first.

(Bottom side up)

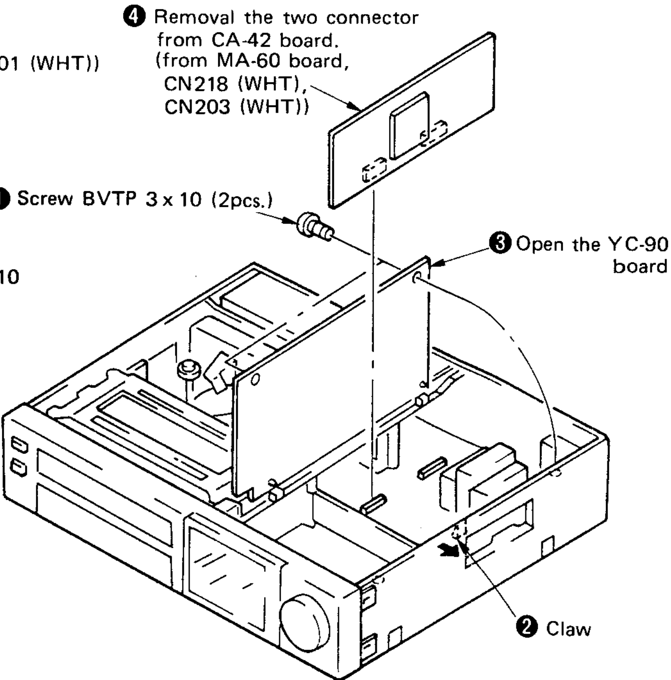
2-5. POWER BLOCK


❷ Screws BVTP 3 x 10 (2pcs.)
❸ Power block
❶ Connector (from power block, CN711 (WHT))

2-6. CASSETTE COMPARTMENT ASSY AND MECHANISM DECK ASSY

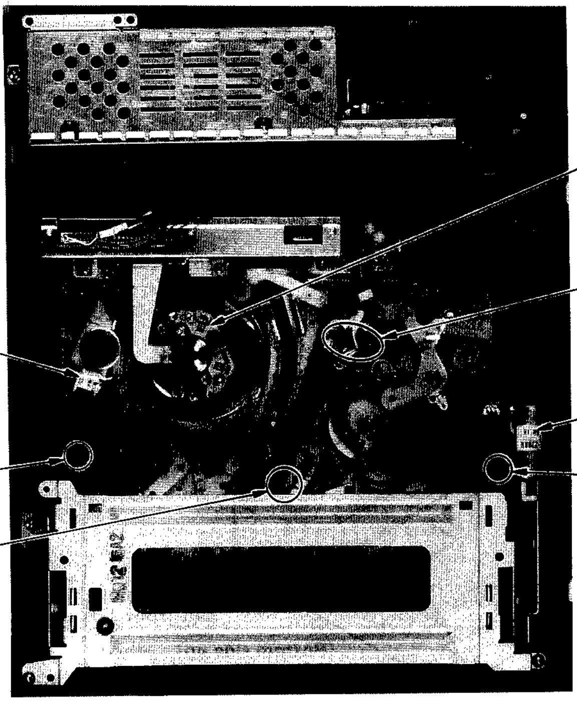

❷ Screw BVTP 3 x 10 (4pcs.)
❶ Connector (from CM-14, CN001 (WHT))
❸ Cassette compartment assy
❼ Screws BVTP 3 x 10
❻ Screw BVTP 3 x 10
❽ MD retainer (left)
❹ Connector (from MA-60 board, CN202 (WHT))
❿ Mechanism deck
❾ Special tapping screw
❺ Connector (from MA-60 board, CN201 (WHT))

2-7. YC-90 AND CA-42 BOARD


❹ Removal the two connector from CA-42 board. (from MA-60 board, CN218 (WHT), CN203 (WHT))
❶ Screw BVTP 3 x 10 (2pcs.)
❸ Open the YC-90 board
❷ Claw

2-8. INTERNAL VIEWS

—Top Side—



Upper Drum ass'y DZR-16-R
1-550-534-11
Drum ass'y DZH-16A-R
1-550-533-11

ACE head block ass'y
A-6761-129-A

Full erase head
1-543-647-11

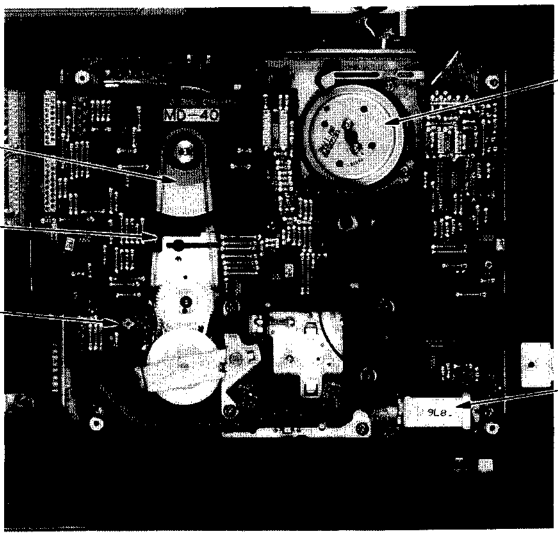
M904
Loading motor
X-3727-784-1

Q001
Tape end sensor
8-729-921-53

Q002
Tape top sensor
8-729-921-53

D001
Tape top/end LED
8-719-974-65

—Botoom Side—



M901
Drum motor

M902
Capstan motor
8-835-382-01

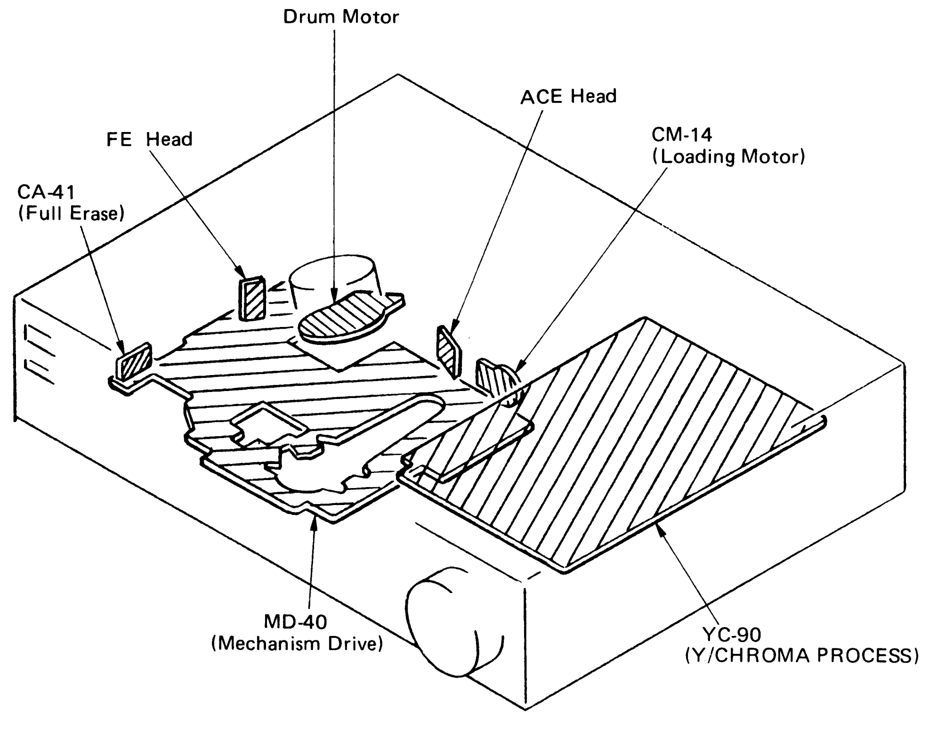
Timing belt
3-736-013-01

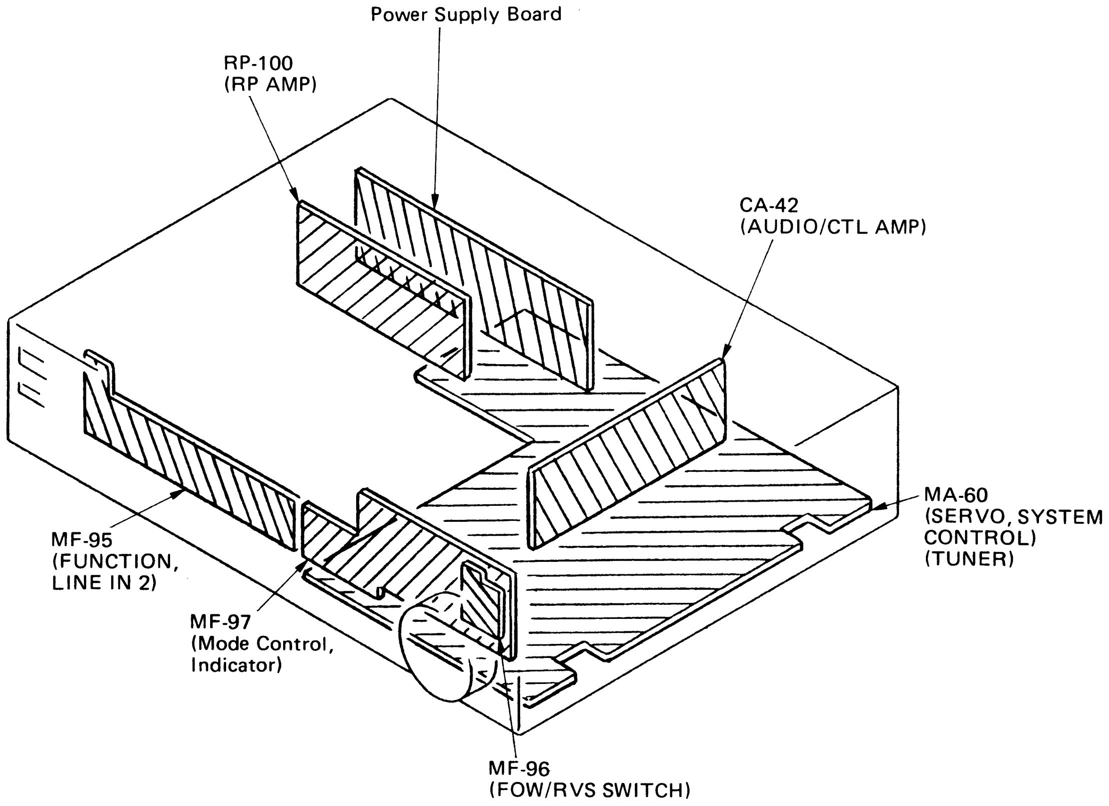
S001
Rotary switch
1-571-920-11

M903
CAM motor ass'y
X-3733-302-1

SECTION 3
DIAGRAMS

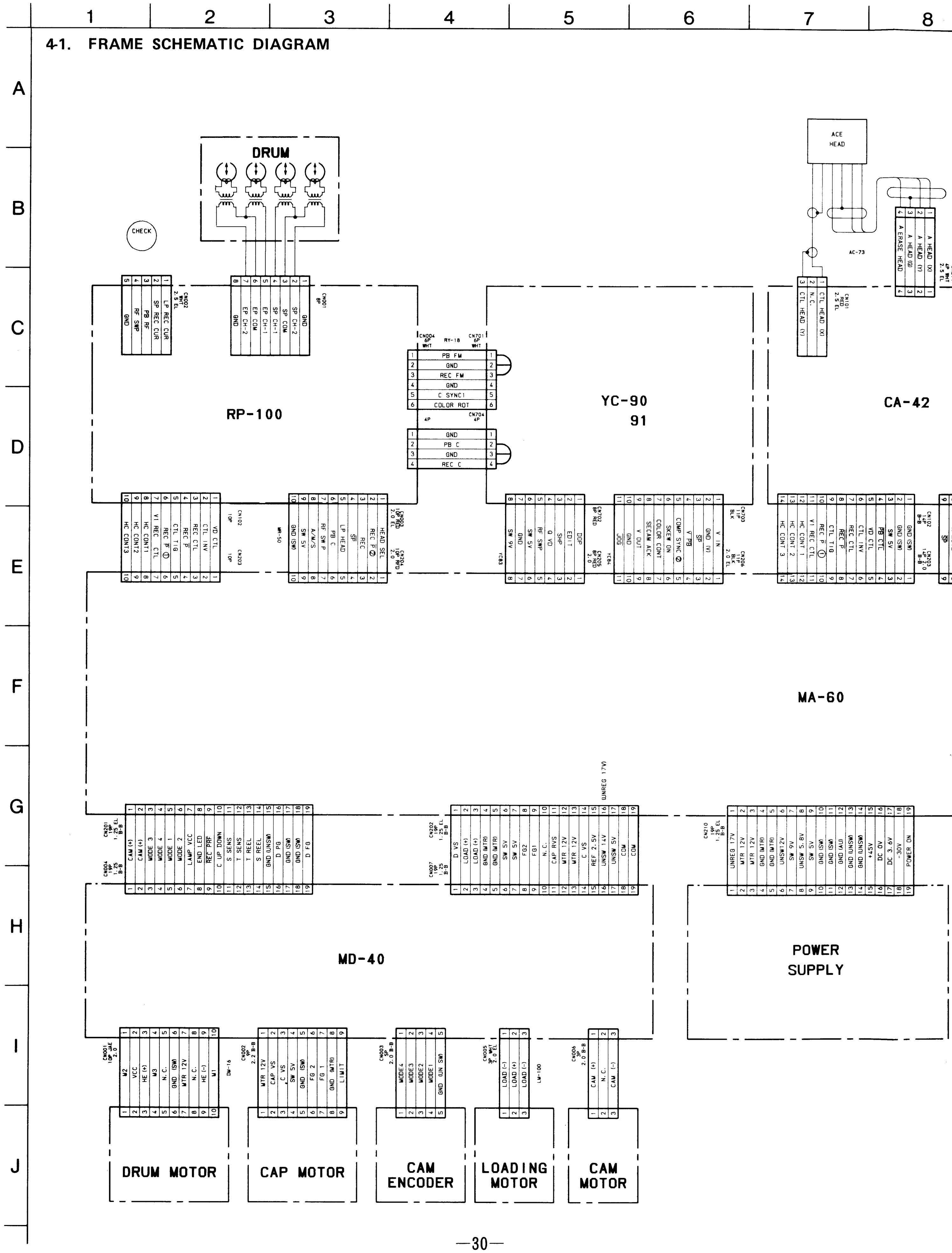
3-1. CIRCUIT BOARDS LOCATION


Drum Motor
ACE Head
FE Head
CM-14
(Loading Motor)
CA-41
(Full Erase)
MD-40
(Mechanism Drive)
YC-90
(Y/CHROMA PROCESS)


Power Supply Board
RP-100
(RP AMP)
CA-42
(AUDIO/CTL AMP)
MA-60
(SERVO, SYSTEM
CONTROL)
(TUNER)
MF-95
(FUNCTION,
LINE IN 2)
MF-97
(Mode Control,
Indicator)
MF-96
(FOW/RVS SWITCH)

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM


1
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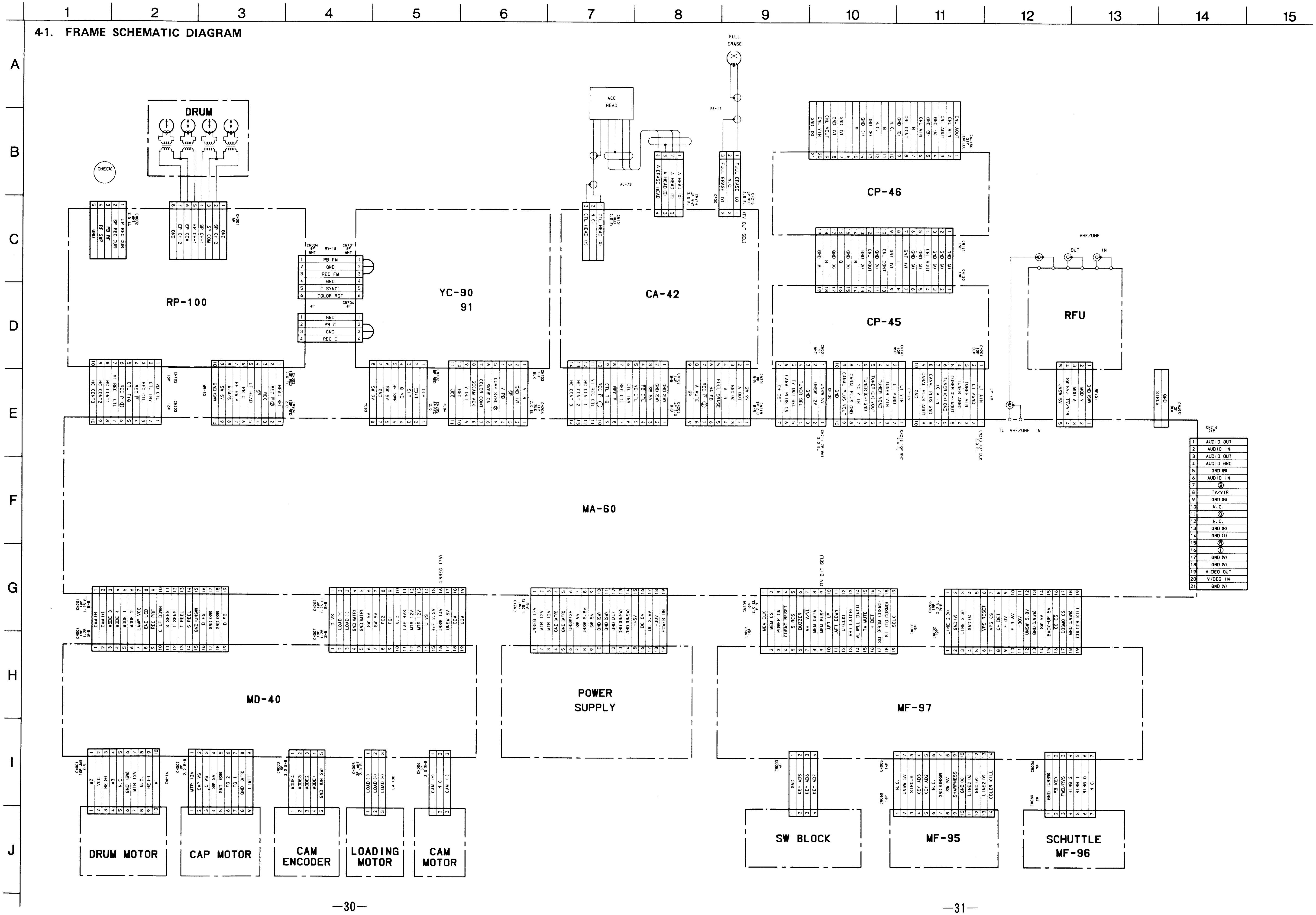
A
B
C
D
E
F
G
H
I
J
DRUM
CHECK
ACE HEAD
RP-100
YC-90
91
CA-42
MA-60
MD-40
POWER
SUPPLY
DRUM MOTOR
CAP MOTOR
CAM
ENCODER
LOADING
MOTOR
CAM
MOTOR

SECTION 4

PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM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13
14
15
A
B
C
D
E
F
G
H
I
J
DRUM
CHECK
RP-100
YC-90
91
ACE HEAD
AC-73
FULL ERASE
FE-17
CA-42
CP-46
CP-45
VHF/UHF
OUT
IN
RFU
TU VHF/UHF IN
MA-60
CN216
21P
1 AUDIO OUT
2 AUDIO IN
3 AUDIO OUT
4 AUDIO GND
5 GND (B)
6 AUDIO IN
7 (B)
8 TV/VTR
9 GND (G)
10 N.C.
11 (G)
12 N.C.
13 GND (R)
14 GND (I)
15 (R)
16 (I)
17 GND (V)
18 GND (V)
19 VIDEO OUT
20 VIDEO IN
21 GND (V)
MD-40
POWER SUPPLY
MF-97
DRUM MOTOR
CAP MOTOR
CAM ENCODER
LOADING MOTOR
CAM MOTOR
SW BLOCK
MF-95
SCHUTTLE MF-96
PB FM
GND
REC FM
GND
C SYNC1
COLOR ROT
PB C
REC C
RY-18
(TV OUT SEL)
(UNREG 17V)

TEM

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAM

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

For printed wiring boards:

- ○— : indicates a lead wire mounted on the component side.
- ●— : indicates a lead wire mounted on the printed side.
- ⊗ or ● : Through hole.
- ▒ : Pattern from the side which enables seeing.
- ░ : Pattern of the rear side.

Caution:

Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component Side)	Parts on the parts face side seen from the parts face are indicated.

For schematic diagram:

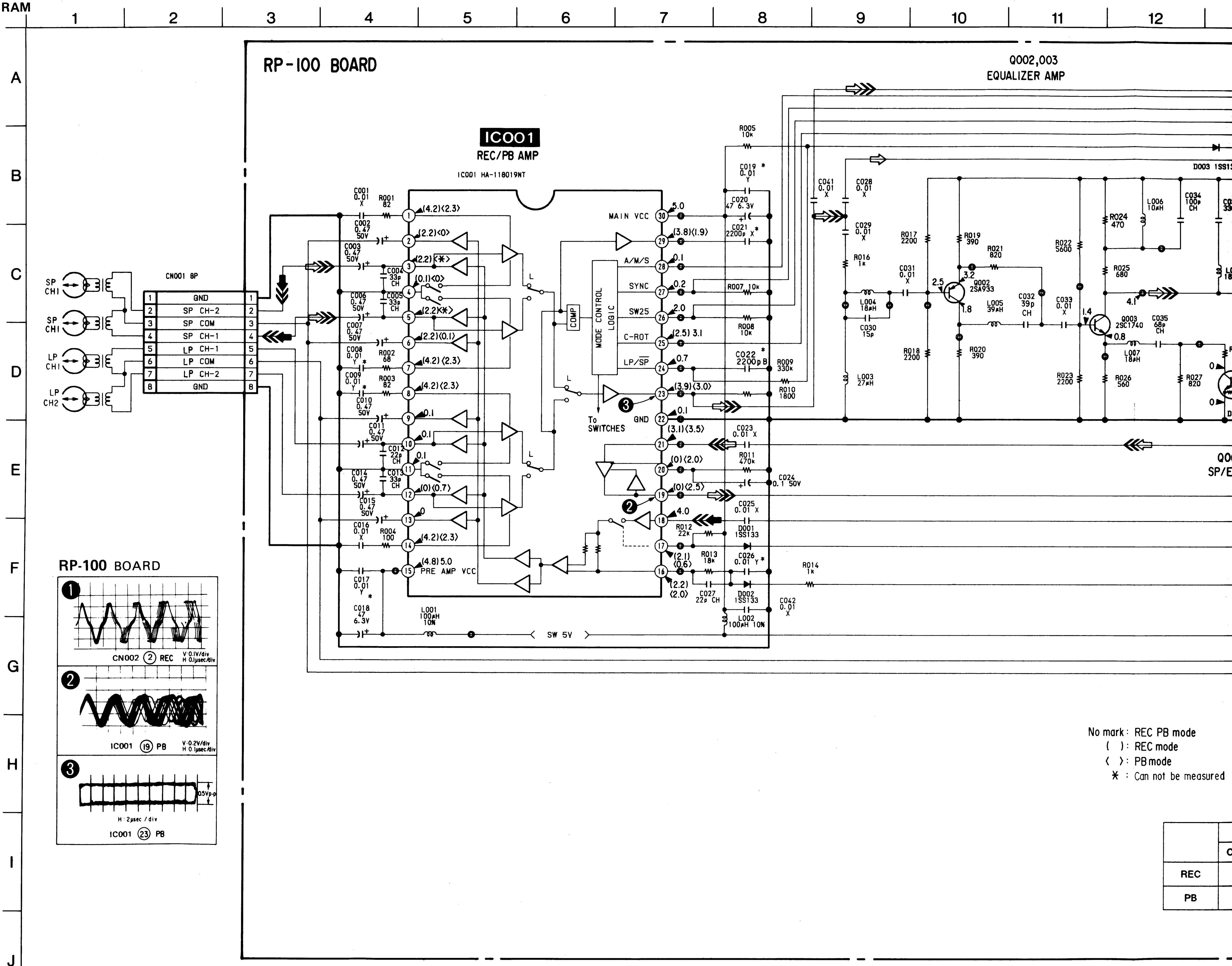
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W (Chip resistors: 1/10W) unless otherwise noted.
  kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF: μμF 50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- ▭ : panel designation.
- △ : internal component.
- ▭ : adjustment for repair.
- ▬▬ : B+ line.
- ▬ ▬ ▬ : B– line.
- Voltages are dc between measurement points and ground unless otherwise noted.
- Readings are taken with a color-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.
- ⇨ : IN/OUT direction of B line (+, –).
- Circled numbers refer to waveforms.

When indicating parts by reference number, please include the board name.

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

RP-100 (HEAD AMP) SCHEMATIC DIAGRAM

—Ref. No. RP-100 Board: 1,000 series—


1
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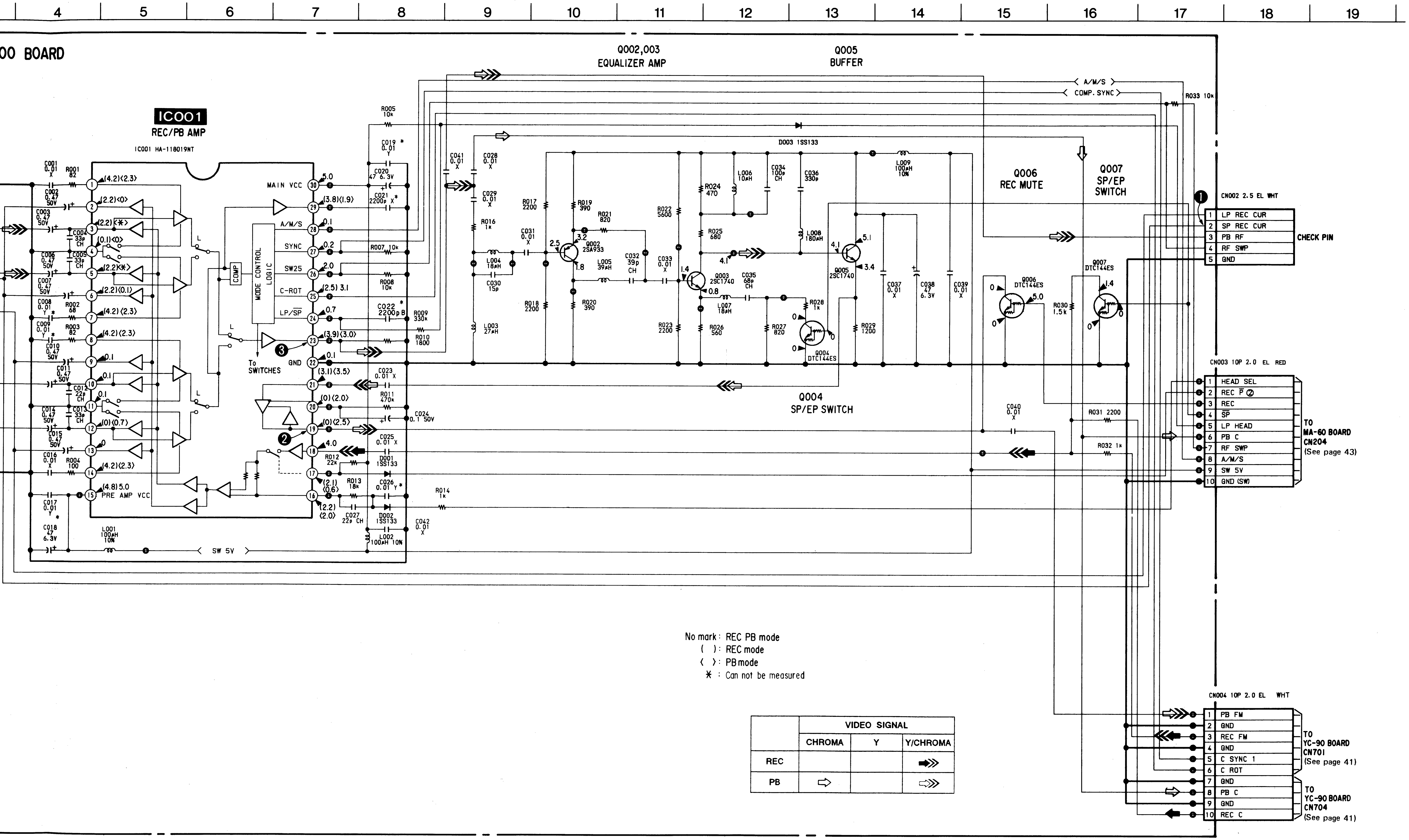
11
12
A
B
C
D
E
F
G
H
I
J
RP-100 BOARD
Q002,003
EQUALIZER AMP
IC001
REC/PB AMP
IC001 HA-118019NT
SP CH1
SP CH1
LP CH1
LP CH2
CN001 8P
GND
SP CH-2
SP COM
SP CH-1
LP CH-1
LP COM
LP CH-2
GND
MAIN VCC
A/M/S
SYNC
SW25
C-ROT
LP/SP
GND
PRE AMP VCC
MODE CONTROL LOGIC
COMP
To SWITCHES
SW 5V
Q002 2SA933
Q003 2SC1740
D001 1SS133
D002 1SS133
L001 100μH 10%
L002 100μH 10%
RP-100 BOARD
CN002 ② REC
V: 0.1V/div
H: 0.1μsec/div
IC001 ⑲ PB
V: 0.2V/div
H: 0.1μsec/div
0.5Vp-p
H: 2μsec / div
IC001 ㉓ PB
REC
PB

No mark: REC PB mode
( ): REC mode
〈 〉: PB mode
✱ : Can not be measured


4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
00 BOARD
IC001
REC/PB AMP
IC001 HA-118019NT
MAIN VCC
A/M/S
SYNC
SW25
C-ROT
LP/SP
GND
MODE CONTROL LOGIC
COMP
To SWITCHES
PRE AMP VCC
SW 5V
Q002,003
EQUALIZER AMP
Q005
BUFFER
Q002 2SA933
Q003 2SC1740
Q005 2SC1740
Q004 DTC144ES
Q004
SP/EP SWITCH
Q006
REC MUTE
Q006 DTC144ES
Q007
SP/EP SWITCH
Q007 DTC144ES
D001 1SS133
D002 1SS133
D003 1SS133
A/M/S
COMP. SYNC
R033 10k
CN002 2.5 EL WHT
1 LP REC CUR
2 SP REC CUR
3 PB RF
4 RF SWP
5 GND
CHECK PIN
CN003 10P 2.0 EL RED
1 HEAD SEL
2 REC P ②
3 REC
4 SP
5 LP HEAD
6 PB C
7 RF SWP
8 A/M/S
9 SW 5V
10 GND (SW)
TO MA-60 BOARD CN204 (See page 43)
CN004 10P 2.0 EL WHT
1 PB FM
2 GND
3 REC FM
4 GND
5 C SYNC 1
6 C ROT
7 GND
8 PB C
9 GND
10 REC C
TO YC-90 BOARD CN701 (See page 41)
TO YC-90 BOARD CN704 (See page 41)

No mark : REC PB mode
( ) : REC mode
〈 〉 : PB mode
＊ : Can not be measured

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC			➡≫
PB	⇨		⇨≫

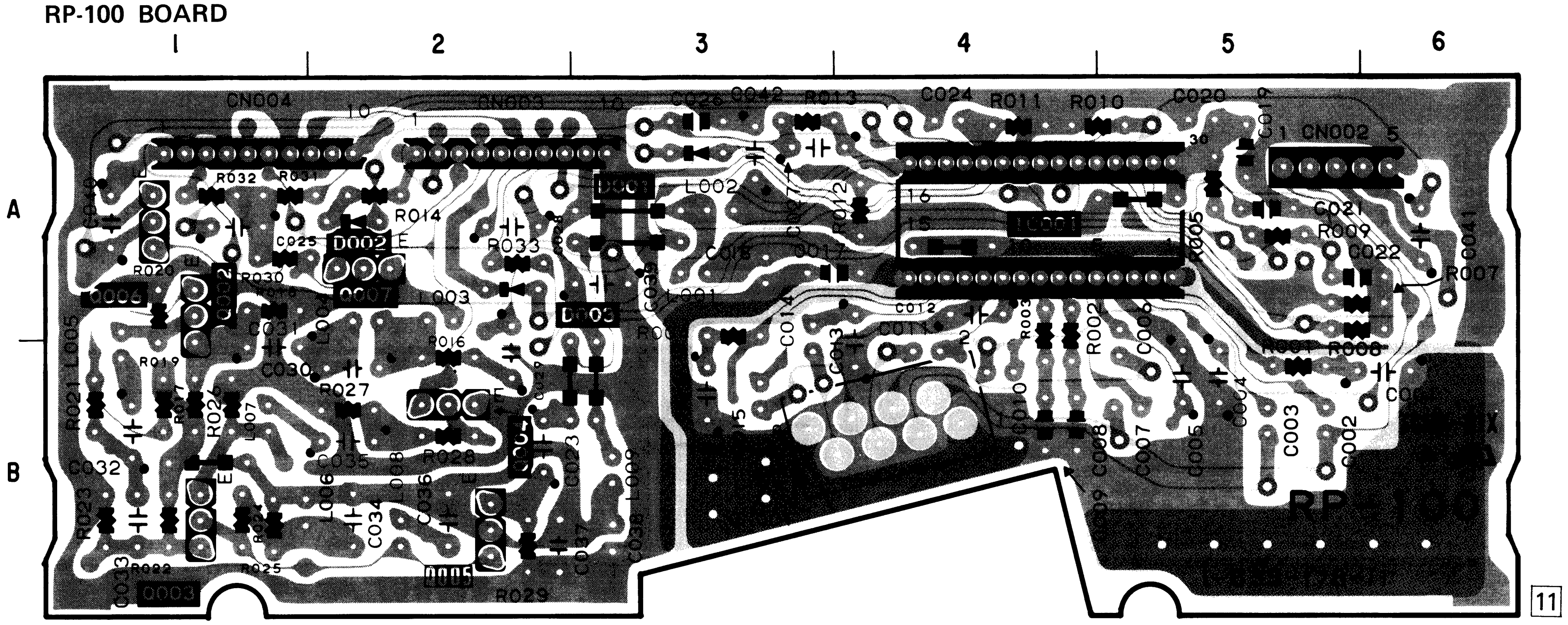
HEAD AMP HEAD AMP

RP-100 (HEAD AMP) PRINTED WIRING BOARD

—Ref. No. RP-100 Board: 1,000 series—

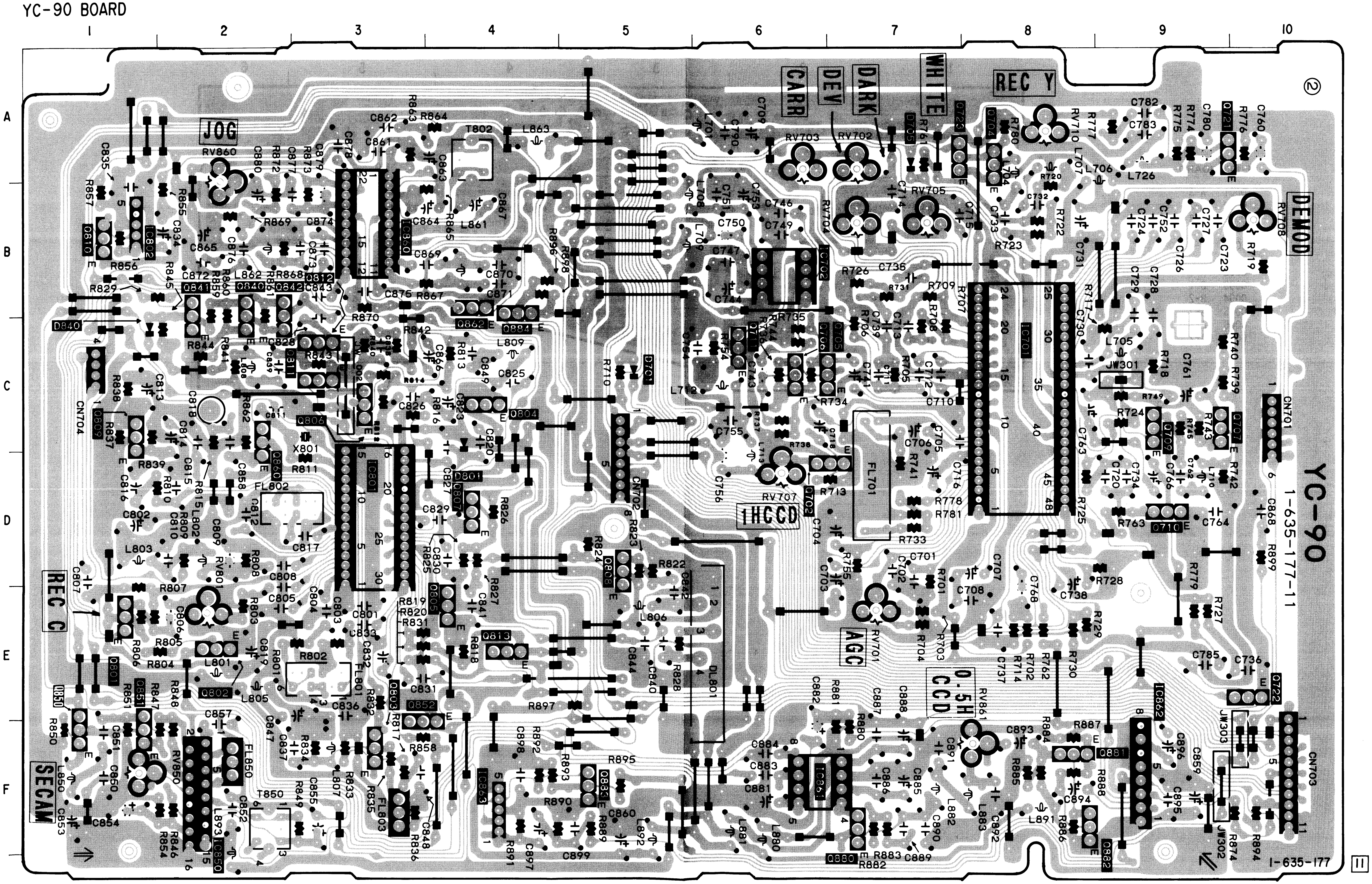
RP-100 BOARD

D001	A-3
D002	A-2
D003	B-3
IC001	A-4
Q002	A-1
Q003	B-1
Q004	B-2
Q005	B-2
Q006	A-1
Q007	A-2


RP-100 BOARD
1
2
3
4
5
6
A
B
CN004
CN003
CN002
IC001
D001
D002
D003
Q002
Q003
Q005
Q006
Q007
L001
L002
L005
L006
L007
R014
R016
R019
R020
R027
R028
R029
R030
R031
R032
R033
R007
R008
R009
R010
R011
R013
C012
C020
C021
C022
C024
C025
C030
C032
C034
C035
RP-100
11

YC-90 (VIDEO) PRINTED WIRING BOARD

–Ref. No. YC-90 Board: 2,000 series–


YC-90 BOARD
1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
JOG
REC C
SECAM
CARR
DEV
DARK
WHITE
REC Y
DEMOD
1HCCD
AGC
0.5H CCD
YC-90
1-635-177-11
1-635-177
②
11
IC701
IC801
IC802
IC850
IC860
IC861
IC862
IC863
IC702
CN701
CN702
CN703
CN704
FL701
FL801
FL802
FL803
FL850
DL801
T802
T850
X801
RV701
RV702
RV703
RV704
RV705
RV707
RV708
RV710
RV801
RV850
RV860
RV861
JW301
JW302
JW303

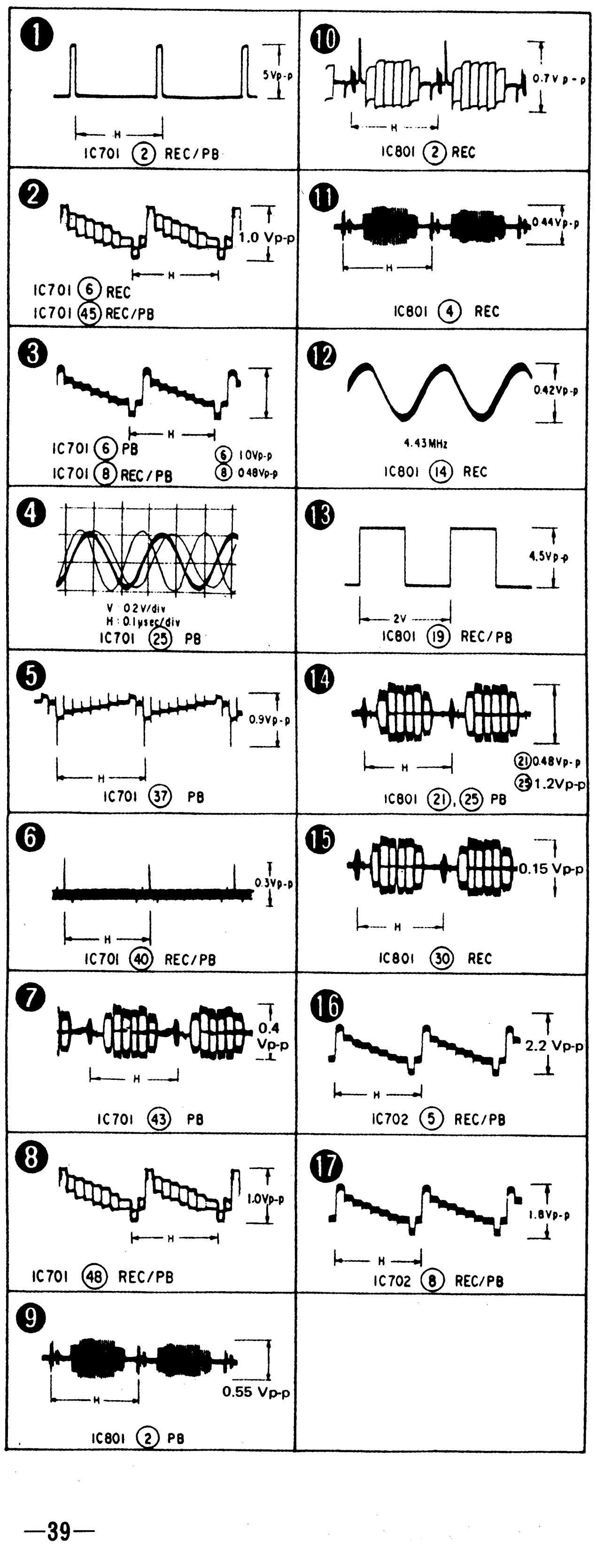
YC-90 (VIDEO) SCHEMATIC DIAGRAM

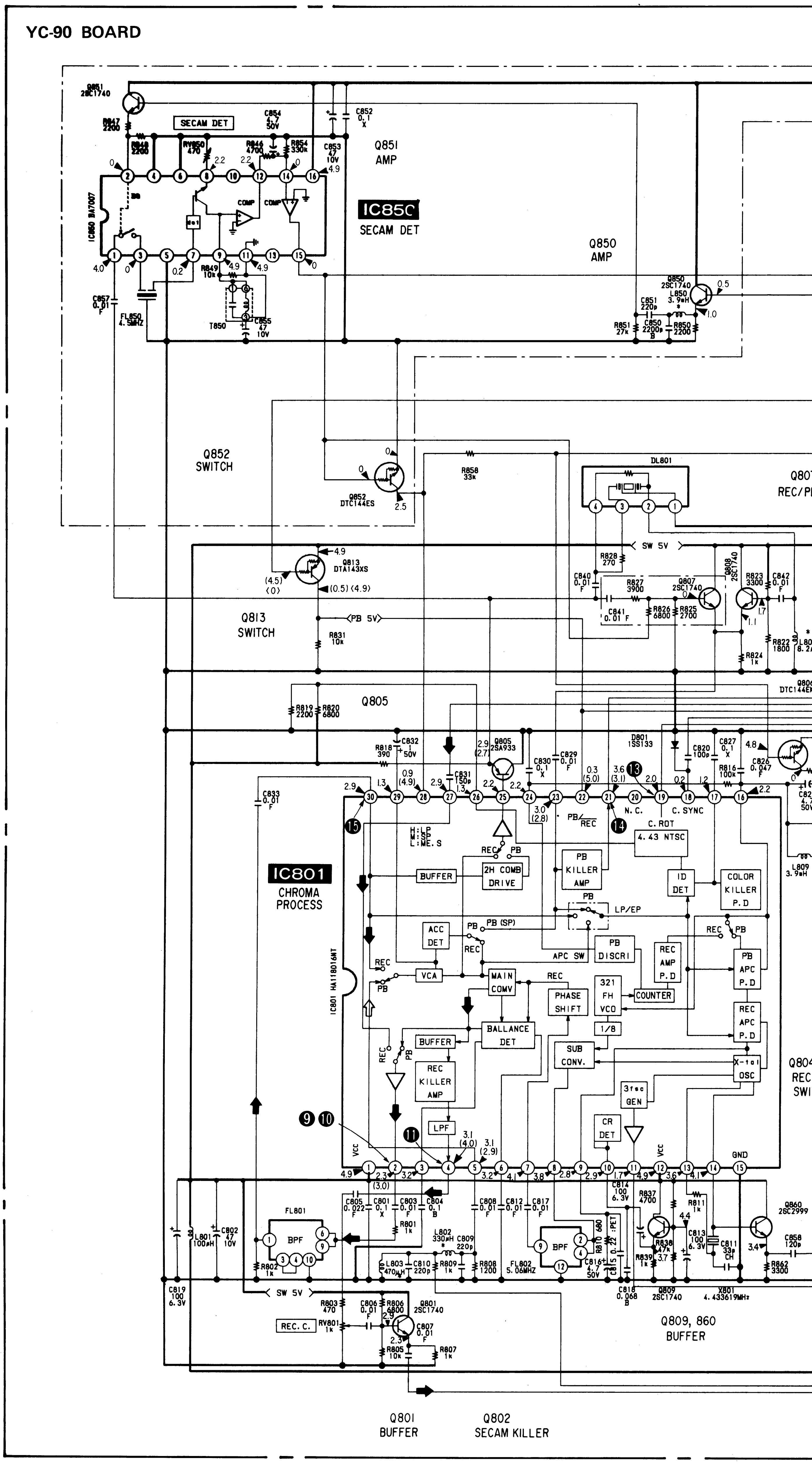
–Ref. No. YC-90 Board: 2,000 series–

YC -90 BOARD

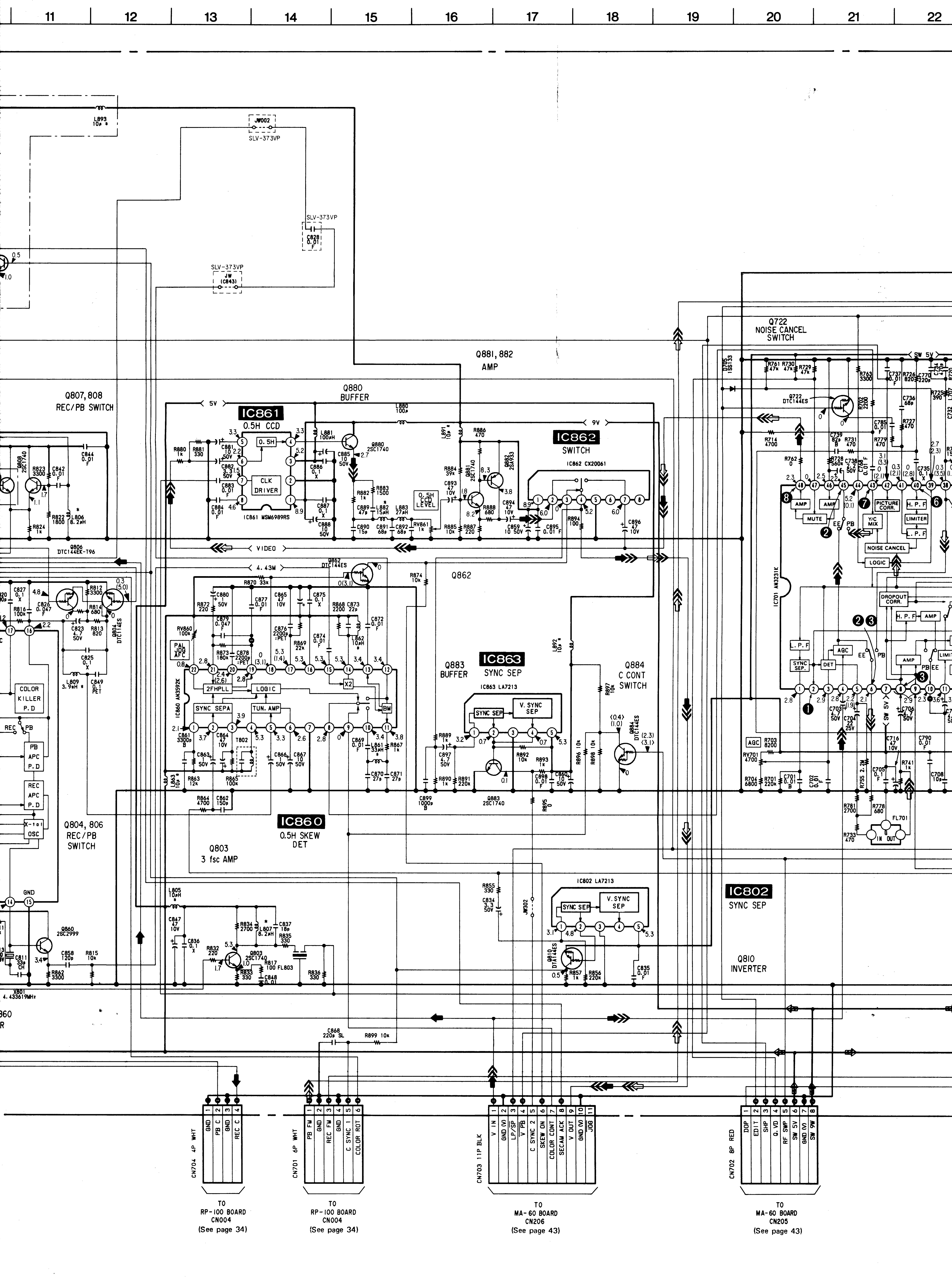
D701	C-5	Q723	A-7
D705	B-7	Q801	E-1
D801	D-4	Q803	E-3
		Q804	C-4
IC701	C-8	Q805	E-4
IC702	B-6	Q806	C-3
IC801	D-3	Q807	D-4
IC802	B-1	Q808	D-5
IC850	F-2	Q809	C-1
IC860	B-3	Q810	D-1
IC861	F-6	Q813	E-4
IC862	F-9	Q850	E-1
IC863	F-4	Q851	E-1
		Q852	E-4
Q702	D-6	Q860	D-2
Q704	A-8	Q862	B-4
Q705	C-7	Q880	F-7
Q706	C-6	Q881	F-9
Q710	D-9	Q882	F-9
Q711	C-6	Q883	F-5
Q721	A-9	Q884	B-4
Q722	E-10		

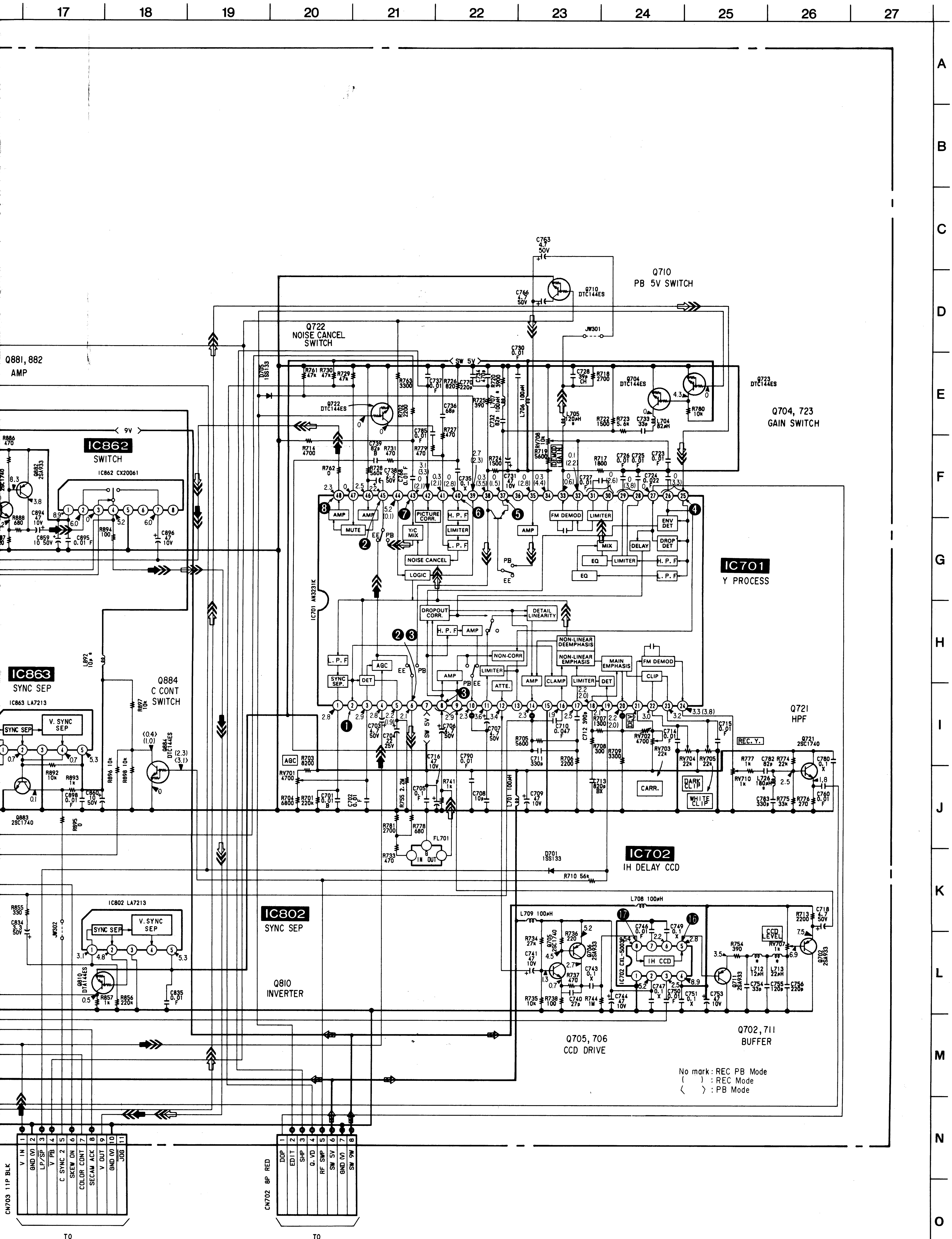
YC-90 BOARD





YC-90 BOARD
SECAM DET
IC850 SECAM DET
IC860 BA7007
Q851 2SC1740
Q851 AMP
Q850 AMP
Q850 2SC1740
FL850 4.5MHz
T850
Q852 SWITCH
Q852 DTC144ES
R858 33k
DL801
Q813 DTA143XS
Q813 SWITCH
PB 5V
SW 5V
Q807 2SC1740
Q808 2SC1740
Q805
Q805 2SA933
D801 1SS133
IC801 CHROMA PROCESS
IC801 HA11801GMT
BUFFER
2H COMB DRIVE
PB KILLER AMP
ID DET
COLOR KILLER P.D
C. ROT
4.43 NTSC
C. SYNC
N. C.
H:LP S:SP L:ME.S
LP/EP
ACC DET
PB DISCRI
APC SW
REC AMP P.D
PB APC P.D
VCA
MAIN CONV
PHASE SHIFT
321 FH VCO
COUNTER
REC APC P.D
BALLANCE DET
1/8
SUB CONV.
X-tal OSC
REC KILLER AMP
3fsc GEN
CR DET
LPF
VCC
GND
FL801 BPF
FL802 5.06MHZ
BPF
L801 100μH
L802 330μH
L803 470μH
REC. C.
RV801 1k
Q801 2SC1740
Q809 2SC1740
X801 4.433619MHz
Q860 2SC2999
Q809, 860 BUFFER
Q801 BUFFER
Q802 SECAM KILLER


11
12
13
14
15
16
17
18
19
20
21
22
L893 10μ
JW002
SLV-373VP
SLV-373VP
C828 0.01 F
SLV-373VP
JW (C843)
Q881, 882 AMP
Q880 BUFFER
Q807, 808 REC/PB SWITCH
IC861
0.5H CCD
0.5H
CLK DRIVER
IC861 MSM6989RS
0.5H CCD LEVEL
IC862
SWITCH
IC862 CX20061
5V
9V
VIDEO
4.43M
Q862
Q722 NOISE CANCEL SWITCH
Q722 DTC144ES
SW 5V
D705 1SS133
IC701 AN3231K
AMP
MUTE
PICTURE CORR.
H. P. F
LIMITER
L. P. F
Y/C MIX
NOISE CANCEL
LOGIC
DROPOUT CORR.
AGC
DET
SYNC SEP.
EE
PB
FL701
IN OUT
AGC
IC860
0.5H SKEW DET
IC860 AN3592K
2FHPLL
LOGIC
SYNC SEPA
TUN. AMP
X2
BM
PAL JOG AFC
T802
Q883 BUFFER
IC863
SYNC SEP
IC863 LA7213
SYNC SEP
V. SYNC SEP
Q884 C CONT SWITCH
Q884 DTC144ES
Q883 2SC1740
Q806 DTC144EK-T96
Q804 DTC144ES
COLOR KILLER P.D
REC PB
PB APC P.D
REC APC P.D
X-tal OSC
Q804, 806 REC/PB SWITCH
Q803 3 fsc AMP
GND
Q860 2SC2999
X801 4.433619MHz
Q803 2SC1740
FL803
IC802 LA7213
SYNC SEP
V. SYNC SEP
IC802
SYNC SEP
Q810 INVERTER
Q810 DTA144ES
JW302
CN704 4P WHT
GND
PB C
GND
REC C
TO RP-100 BOARD CN004 (See page 34)
CN701 6P WHT
PB FM
GND
REC FM
GND
C SYNC 1
COLOR ROT
TO RP-100 BOARD CN004 (See page 34)
CN703 11P BLK
V IN
GND (V)
LP/SP
V PB
C SYNC 2
SKEW ON
COLOR CONT
SECAM ACK
V OUT
GND (V)
JOG
TO MA-60 BOARD CN206 (See page 43)
CN702 8P RED
DOP
EDIT
SHP
Q. VD
RF SWP
SW 5V
GND
SW 9V
TO MA-60 BOARD CN205 (See page 43)


17
18
19
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22
23
24
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26
27
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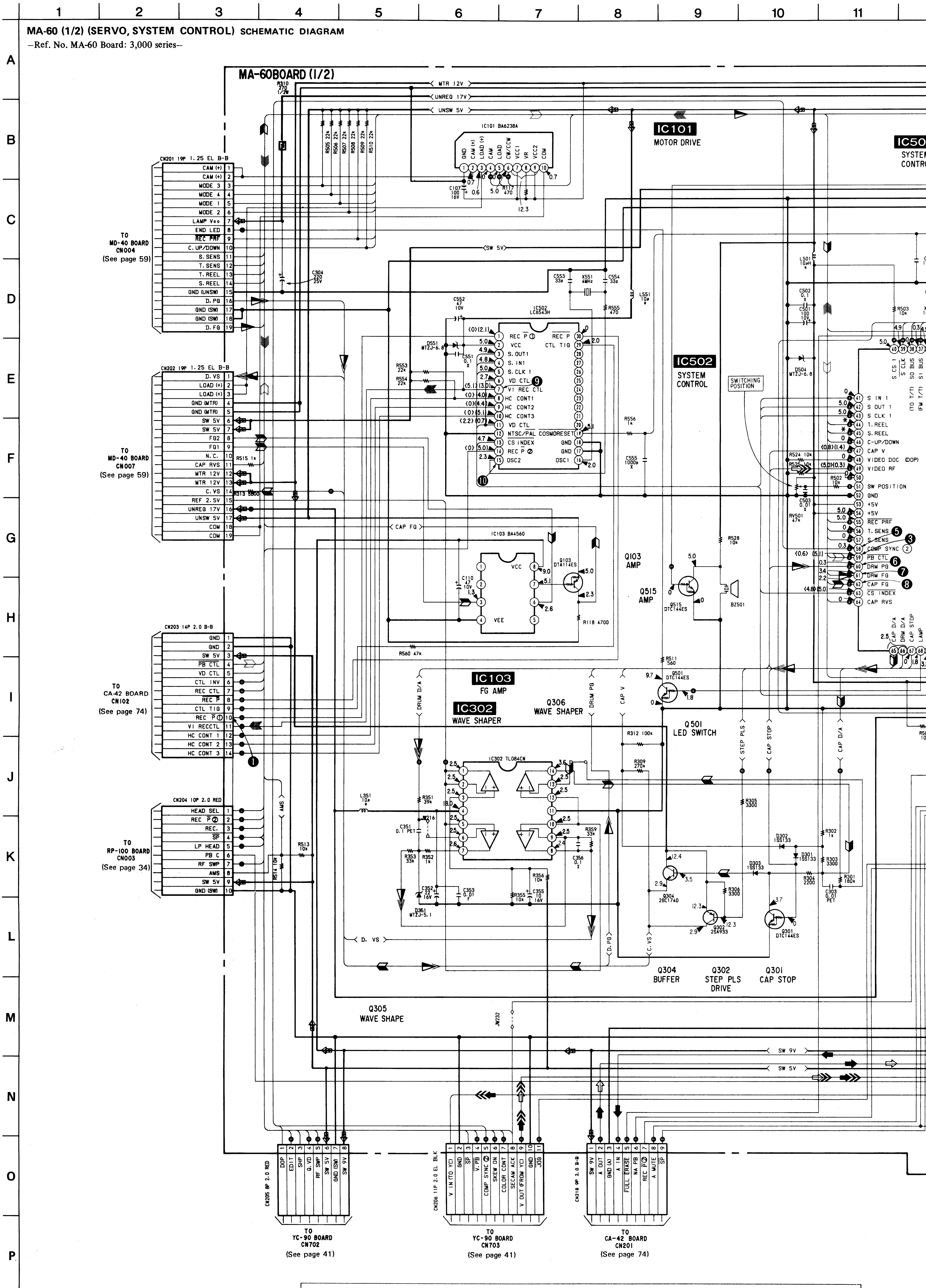
C
D
E
F
G
H
I
J
K
L
M
N
O
Q710
PB 5V SWITCH
Q710 DTC144ES
Q722
NOISE CANCEL
SWITCH
Q722 DTC144ES
Q881, 882
AMP
IC862
SWITCH
IC862 CX20061
9V
SW 5V
Q704 DTC144ES
Q723 DTC144ES
Q704, 723
GAIN SWITCH
IC701
Y PROCESS
IC701 AN3231K
AMP
MUTE
PICTURE CORR.
Y/C MIX
H. P. F
LIMITER
L. P. F
NOISE CANCEL
LOGIC
AMP
FM DEMOD
LIMITER
MIX
DELAY
ENV DET
DROP DET
EQ
LIMITER
H. P. F
EQ
L. P. F
DROPOUT CORR.
DETAIL LINEARITY
H. P. F
AMP
NON-LINEAR DEEMPHASIS
NON-LINEAR EMPHASIS
NON-CORR
MAIN EMPHASIS
FM DEMOD
CLIP
L. P. F
AGC
SYNC SEP.
DET
AMP
LIMITER
ATTE.
AMP
CLAMP
LIMITER
DET
DEV
AGC
CARR.
DARK CLIP
WHITE CLIP
REC. Y.
IC863
SYNC SEP
IC863 LA7213
SYNC SEP
V. SYNC SEP
Q884
C CONT
SWITCH
Q884 DTC144ES
Q883 2SC1740
Q721
HPF
Q721 2SC1740
IC702
1H DELAY CCD
IC702 CXL-5009
1H CCD
D701 1SS133
D705 1SS133
FL701
IN OUT
IC802 LA7213
IC802
SYNC SEP
SYNC SEP
V. SYNC SEP
Q810 DTA144ES
Q810
INVERTER
Q705 2SC1740
Q706 2SA933
Q705, 706
CCD DRIVE
Q711 2SA933
Q702 2SA933
Q702, 711
BUFFER
CCD LEVEL
RV707
No mark : REC PB Mode
( ) : REC Mode
〈 〉 : PB Mode
CN703 11P BLK
1 V IN
2 GND (V)
3 LP/SP
4 V PB
5 C SYNC 2
6 SKEW ON
7 COLOR CONT
8 SECAM ACK
9 V OUT
10 GND (V)
11 JOG
TO
MA-60 BOARD
CN206
(See page 43)
CN702 8P RED
1 DOP
2 EDIT
3 SHP
4 Q. VD
5 RF SWP
6 SW 5V
7 GND (V)
8 SW 9W
TO
MA-60 BOARD
CN205
(See page 43)

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC	➡	➡»	➡»»
PB	⇨	⇨»	⇨»»

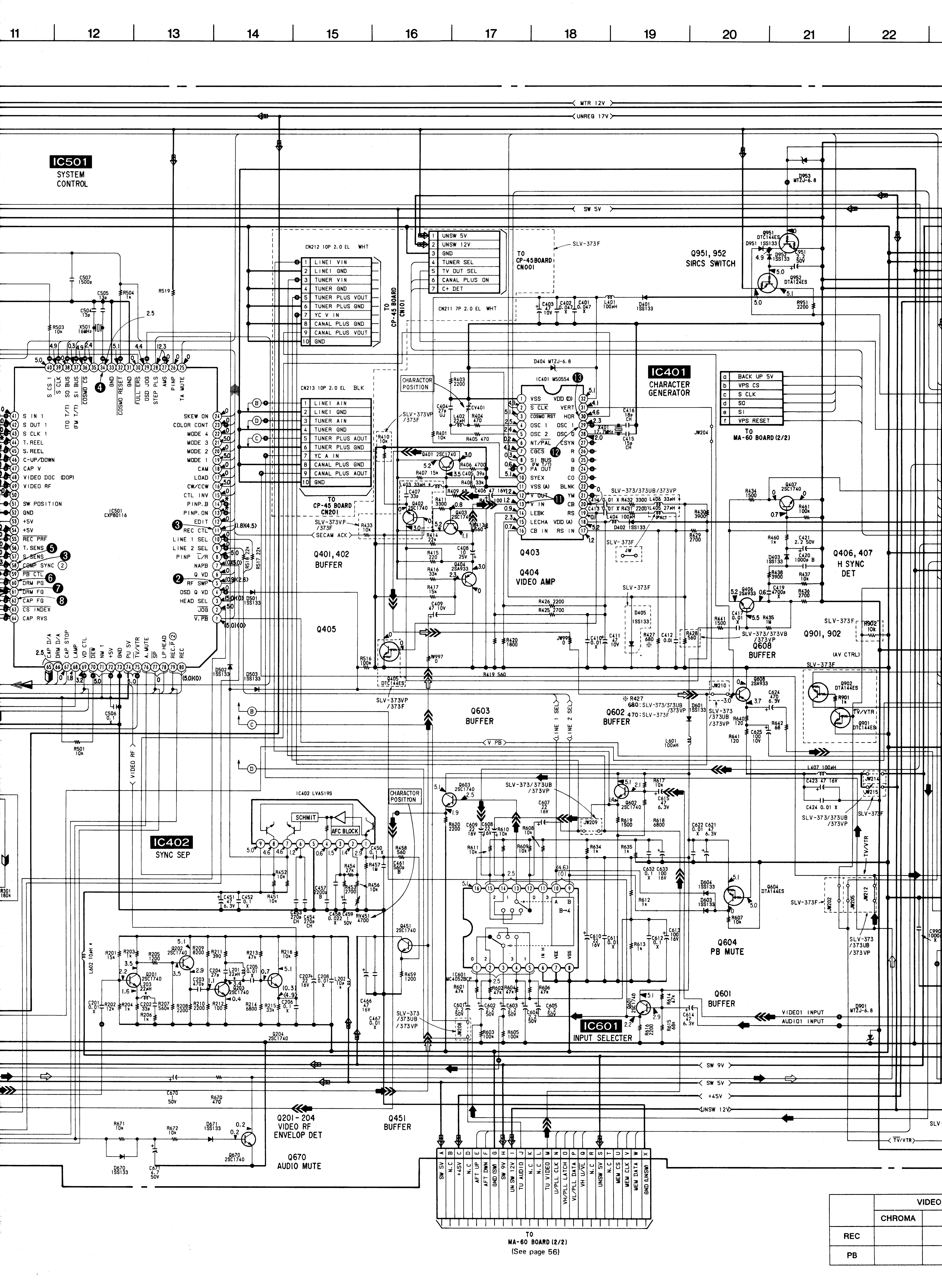
VIDEO VIDEO

MA-60 (1/2) (SERVO, SYSTEM CONTROL) SCHEMATIC DIAGRAM

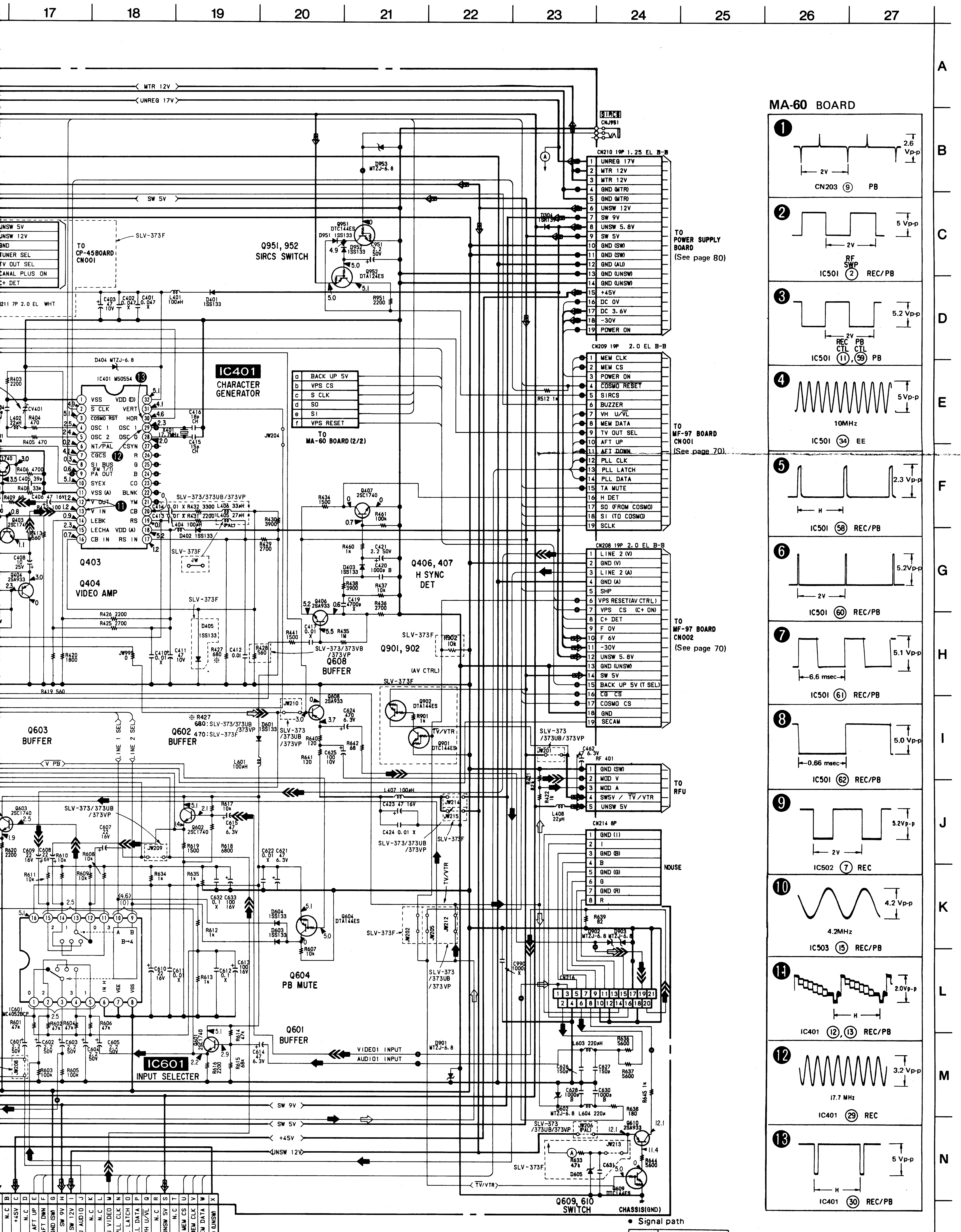
—Ref. No. MA-60 Board: 3,000 series—


MA-60BOARD (1/2)
MTR 12V
UNREG 17V
UNSW 5V
SW 5V
IC101 BA6238A
IC101 MOTOR DRIVE
GND CAM (+) LOAD (+) CAM LOAD CW/CCW VCC1 VR VCC2 COM
R505 22k R506 22k R507 22k R508 22k R509 22k R510 22k
R310 270 1/2W
C107 100 16V
R117 470
CN201 19P 1.25 EL B-B
CAM (+) CAM (+) MODE 3 MODE 4 MODE 1 MODE 2 LAMP Vcc END LED REC PRF C. UP/DOWN S. SENS T. SENS T. REEL S. REEL GND (UNSW) D. PG GND (SW) GND (SW) D. FG
TO MD-40 BOARD CN004 (See page 59)
C304 220 25V
C553 33p X551 4MHz C554 33p L551 10μ R555 470
C552 47 10V
IC502 LC6543H
REC P ① VCC S. OUT1 S. IN1 S. CLK 1 VD CTL V1 REC CTL HC CONT1 HC CONT2 HC CONT3 VD CTL NTSC/PAL CS INDEX REC P ② OSC2
REC P CTL TIG COSMORESET GND GND OSC1
D551 MTZJ-6.8 C551 0.1
R553 22k R554 22k
IC502 SYSTEM CONTROL
SWITCHING POSITION
D504 MTZJ-6.8
L501 10μH C502 0.1 C501 100 10V
R556 1k C555 1000p
CN202 19P 1.25 EL B-B
D. VS LOAD (+) LOAD (+) GND (MTR) GND (MTR) SW 5V SW 5V FG2 FG1 N. C. CAP RVS MTR 12V MTR 12V C. VS REF 2.5V UNREG 17V UNSW 5V COM COM
TO MD-40 BOARD CN007 (See page 59)
R515 1k R313 5600
CAP FG
IC103 BA4560
VCC VEE
C110 47 10V
Q103 DTA114ES
R118 4700
Q103 AMP
Q515 AMP
Q515 DTC144ES
BZ501
R528 10k
R560 47k
CN203 14P 2.0 B-B
GND GND SW 5V PB CTL VD CTL CTL INV REC CTL REC P CTL TIG REC P ① V1 RECCTL HC CONT 1 HC CONT 2 HC CONT 3
TO CA-42 BOARD CN102 (See page 74)
IC103 FG AMP
IC302 WAVE SHAPER
Q306 WAVE SHAPER
DRUM D/A DRUM PG CAP V
R511 560
Q501 DTC144ES
Q501 LED SWITCH
STEP PLS CAP STOP CAP D/A
R312 100k R309 270k
IC302 TL084CN
CN204 10P 2.0 RED
HEAD SEL REC P ② REC. SP LP HEAD PB C RF SWP AMS SW 5V GND (SW)
TO RP-100 BOARD CN003 (See page 34)
AMS
R513 10k R514 10k
L351 10μ R351 39k C351 0.1 PET R353 33k R352 1k
C352 22 16V C353 0.01 D361 MTZJ-5.1
R355 10k C355 10 16V R356 10k R359 33k C356 0.1
R305 3300
D302 1SS133 D301 1SS133 D303 1SS133
R302 1k R303 3300 R304 2200 R301 180k C303 0.01 PET
Q304 2SC1740 Q302 2SA933 Q301 DTC144ES
R306 3300
D. VS D. PG C. VS
Q304 BUFFER
Q302 STEP PLS DRIVE
Q301 CAP STOP
Q305 WAVE SHAPE
JW232
SW 9V SW 5V
R524 10k R525 10k R502 10k C503 0.01 RV501 47k R503 10k
S IN 1 S OUT 1 S CLK 1 T. REEL S. REEL C-UP/DOWN CAP V VIDEO DOC (DOP) VIDEO RF SW POSITION GND +5V +5V REC PRF T. SENS S. SENS COMP SYNC PB CTL DRM PG DRM FG CAP FG CS INDEX CAP RVS
S CS 1 S CLK SO BUS SI BUS
CAP D/A DRM D/A CAP STOP LAMP
IC50 SYSTEM CONTR
CN205 8P 2.0 RED
DOP EDIT SHP Q. VD RF SWP SW 5V GND (SW) SW 9V
TO YC-90 BOARD CN702 (See page 41)
CN206 11P 2.0 EL BLK
V IN (TO YC) GND SP V. PB COMP SYNC ② SKEW ON COLOR CONT SECAM ACK V OUT (FROM YC) GND JOG
TO YC-90 BOARD CN703 (See page 41)
CN218 9P 2.0 B-B
SW 9V A OUT GND (A) A IN FULL ERASE NA PB REC P ② A MUTE SP
TO CA-42 BOARD CN201 (See page 74)
1 2 3 4 5 6 7 8 9 10 11
A B C D E F G H I J K L M N O P

SERVO, SYSTEM CONTROL SERVO, SYSTEM CONTROL


11 12 13 14 15 16 17 18 19 20 21 22
MTR 12V
UNREG 17V
SW 5V
IC501
SYSTEM CONTROL
IC501 CXP80116
CN212 10P 2.0 EL WHT
1 LINE1 VIN
2 LINE1 GND
3 TUNER VIN
4 TUNER GND
5 TUNER PLUS VOUT
6 TUNER PLUS GND
7 YC V IN
8 CANAL PLUS GND
9 CANAL PLUS VOUT
10 GND
TO CP-45 BOARD CN101
1 UNSW 5V
2 UNSW 12V
3 GND
4 TUNER SEL
5 TV OUT SEL
6 CANAL PLUS ON
7 C+ DET
TO CP-45BOARD CN001
SLV-373F
CN211 7P 2.0 EL WHT
CN213 10P 2.0 EL BLK
1 LINE1 AIN
2 LINE1 GND
3 TUNER AIN
4 TUNER GND
5 TUNER PLUS AOUT
6 TUNER PLUS GND
7 YC A IN
8 CANAL PLUS GND
9 CANAL PLUS AOUT
10 GND
TO CP-45 BOARD CN201
CHARACTOR POSITION
IC401
CHARACTER GENERATOR
IC401 M50554
a BACK UP 5V
b VPS CS
c S CLK
d SO
e SI
f VPS RESET
TO MA-60 BOARD (2/2)
Q951, 952
SIRCS SWITCH
Q401, 402
BUFFER
Q403
Q404
VIDEO AMP
Q405
Q406, 407
H SYNC DET
Q608
BUFFER
Q901, 902
Q603
BUFFER
Q602
BUFFER
IC402 LVA519S
SCHMIT
AFC BLOCK
IC402
SYNC SEP
IC601 MC4052BCP
IC601
INPUT SELECTER
Q604
PB MUTE
Q601
BUFFER
VIDEO1 INPUT
AUDIO1 INPUT
Q451
BUFFER
Q201-204
VIDEO RF
ENVELOP DET
Q670
AUDIO MUTE
SW 9V
SW 5V
+45V
UNSW 12V
TV/VTR
V PB
LINE 1 SEL
LINE 2 SEL
VIDEO RF
SW 5V
N.C
+45V
AFT UP
AFT DWN
GND (SW)
SW 9V
UN SW 12V
TU AUDIO
N.C
N.C
TU VIDEO
U/PLL LATCH
VH/PLL CLK
VL/PLL DATA
VH U/VL
UNSW 5V
N.C
MEM CS
MEM CLK
MEM DATA
GND (UNSW)
TO MA-60 BOARD (2/2)
(See page 56)
VIDEO
CHROMA
REC
PB

SERVO, SYSTEM CONTROL


17
18
19
20
21
22
23
24
25
26
27
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
MTR 12V
UNREG 17V
SW 5V
SIRCS
CNJ951
CN210 19P 1.25 EL B-B
UNREG 17V
MTR 12V
MTR 12V
GND (MTR)
GND (MTR)
UNSW 12V
SW 9V
UNSW 5.8V
SW 5V
GND (SW)
GND (SW)
GND (AU)
GND (UNSW)
GND (UNSW)
+45V
DC 0V
DC 3.6V
-30V
POWER ON
TO POWER SUPPLY BOARD (See page 80)
Q951, 952 SIRCS SWITCH
TO CP-45BOARD CN001
SLV-373F
IC401 CHARACTER GENERATOR
IC401 M50554
BACK UP 5V
VPS CS
S CLK
SO
SI
VPS RESET
TO MA-60 BOARD (2/2)
CN209 19P 2.0 EL B-B
MEM CLK
MEM CS
POWER ON
COSMO RESET
SIRCS
BUZZER
VH U/VL
MEM DATA
TV OUT SEL
AFT UP
AFT DOWN
PLL CLK
PLL LATCH
PLL DATA
TA MUTE
H DET
SO (FROM COSMO)
SI (TO COSMO)
SCLK
TO MF-97 BOARD CN001 (See page 70)
Q406, 407 H SYNC DET
Q403 Q404 VIDEO AMP
CN208 19P 2.0 EL B-B
LINE 2 (V)
GND (V)
LINE 2 (A)
GND (A)
SHP
VPS RESET(AV CTRL)
VPS CS (C+ ON)
C+ DET
F 0V
F 6V
-30V
UNSW 5.8V
GND (UNSW)
SW 5V
BACK UP 5V (T SEL)
CG CS
COSMO CS
GND
SECAM
TO MF-97 BOARD CN002 (See page 70)
Q608 BUFFER
Q901, 902 (AV CTRL)
Q603 BUFFER
Q602 BUFFER
RF 401
GND (SW)
MOD V
MOD A
SWSV / TV/VTR
UNSW 5V
TO RFU
CN214 8P
GND (I)
I
GND (B)
B
GND (G)
G
GND (R)
R
MOUSE
Q604 PB MUTE
Q601 BUFFER
IC601 INPUT SELECTER
IC601 MC4052BCP
VIDEO1 INPUT
AUDIO1 INPUT
SW 9V
SW 5V
+45V
UNSW 12V
TV/VTR
Q609, 610 SWITCH
CHASSIS(GND)
TO MA-60 BOARD (2/2) (See page 56)
MA-60 BOARD
① CN203 ⑨ PB 2.6 Vp-p
② IC501 ② REC/PB 5 Vp-p RF SWP
③ IC501 ⑪, 59 PB 5.2 Vp-p REC CTL PB CTL
④ IC501 34 EE 5 Vp-p 10MHz
⑤ IC501 58 REC/PB 2.3 Vp-p
⑥ IC501 60 REC/PB 5.2Vp-p
⑦ IC501 61 REC/PB 5.1 Vp-p 6.6 msec
⑧ IC501 62 REC/PB 5.0 Vp-p 0.66 msec
⑨ IC502 ⑦ REC 5.2Vp-p
⑩ IC503 ⑮ REC/PB 4.2 Vp-p 4.2MHz
⑪ IC401 ⑫, ⑬ REC/PB 2.0Vp-p
⑫ IC401 29 REC 3.2 Vp-p 17.7 MHz
⑬ IC401 30 REC/PB 5 Vp-p

• Signal path

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC			⇛
PB			

	AUDIO Signal
REC	➡
PB	⇨

	REC	REC/PB	PB
Ref. signal	➤		▷

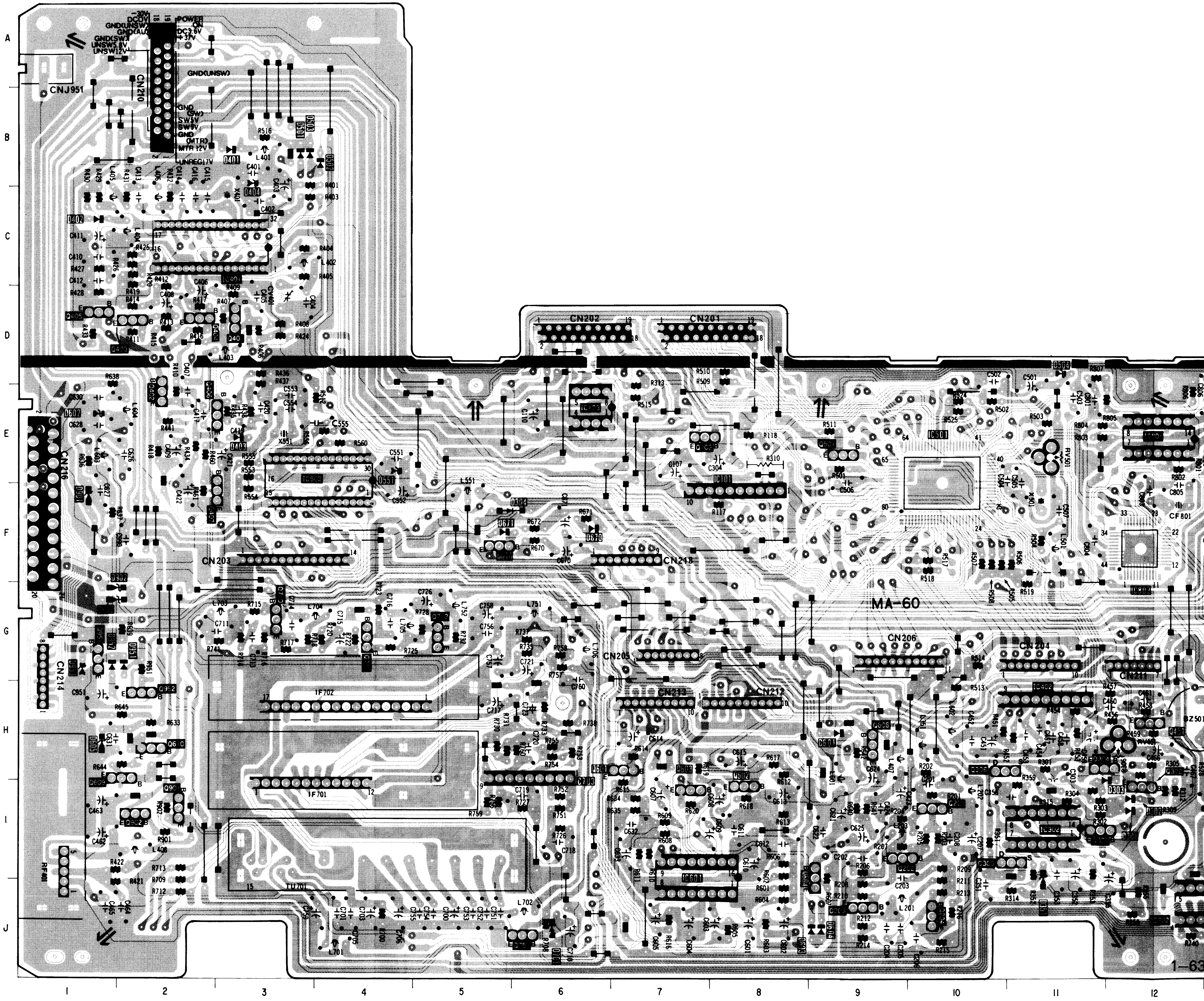
MA-60 (SERVO, SYSTEM CONTROL) PRINTED WIRING BOARD

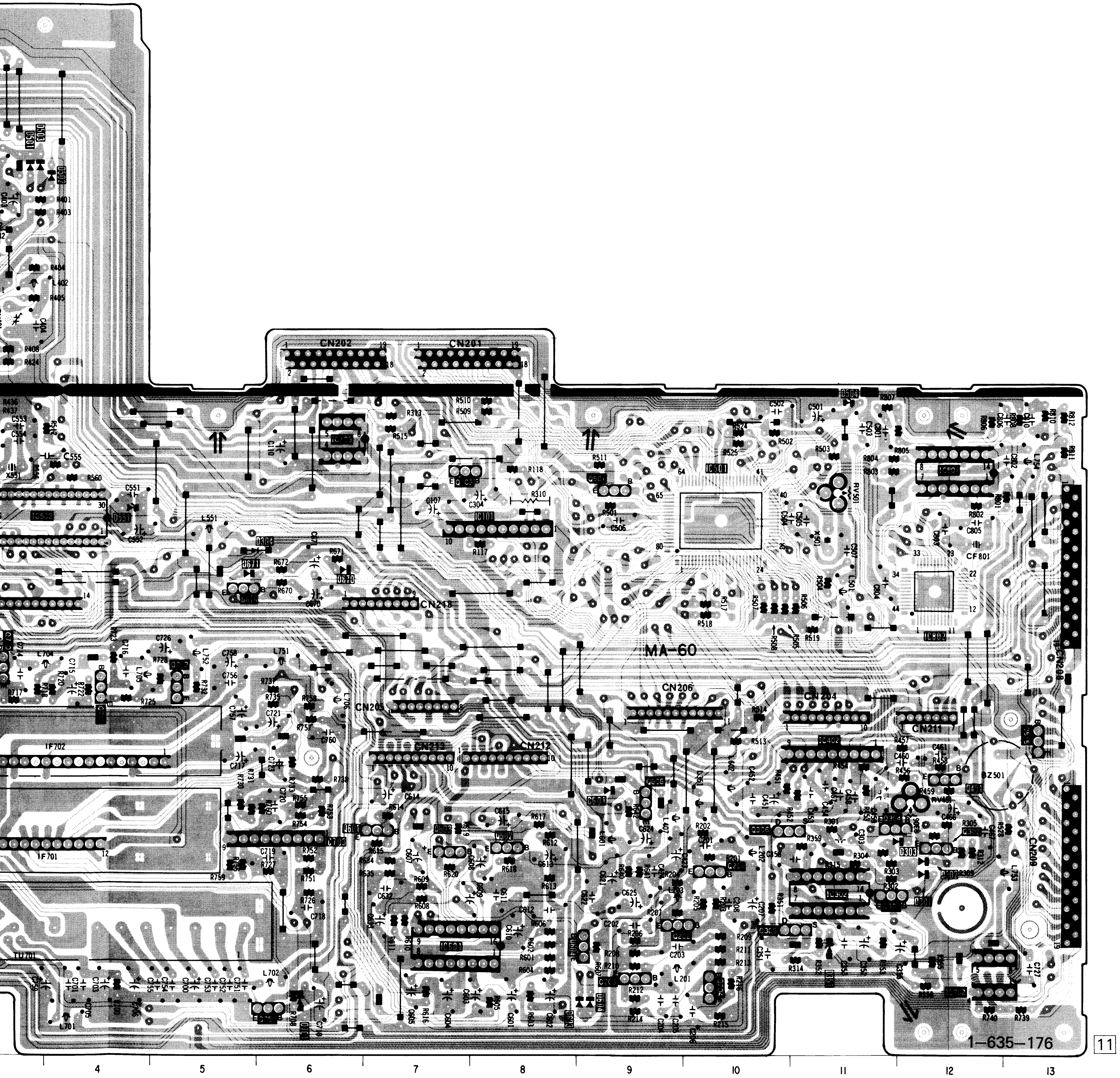
–Ref. No. MA-60 Board: 3,000 series–

MA-60 BOARD

D301	I-12	IC702	J-12
D302	I-12	IC801	E-12
D303	I-11	IC802	G-12
D304	F-5		
D351	J-11	Q103	E-7
D401	B-3	Q201	I-10
D402	C-1	Q202	I-10
D403	E-3	Q203	J-9
D404	C-3	Q204	J-10
D501	B-3	Q301	I-11
D502	B-3	Q302	I-12
D503	B-3	Q304	H-11
D504	E-11	Q401	D-3
D551	F-4	Q402	E-2
D601	H-9	Q403	D-1
D602	E-1	Q404	D-2
D603	J-8	Q405	D-1
D604	J-9	Q406	E-2
D670	F-6	Q407	F-2
D671	F-5	Q451	H-12
D701	J-6	Q501	E-9
D901	F-1	Q515	H-13
D902	G-1	Q601	H-7
D903	G-1	Q602	H-8
D951	G-2	Q603	H-7
D952	G-1	Q604	I-9
D953	G-1	Q608	H-9
		Q609	I-1
IC101	F-8	Q610	H-2
IC103	E-6	Q670	F-5
IC302	I-11	Q710	G-3
IC401	C-2	Q711	G-4
IC402	H-11	Q712	G-5
IC501	E-10	Q751	J-6
IC502	E-4	Q951	G-1
IC601	J-7	Q952	H-2

MA-60 BOARD


A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
9
10
11
12
CNJ951
CN210
CN202
CN201
CN216
CN203
CN218
CN214
CN205
CN206
CN204
CN213
CN212
CN211
IF702
IF701
TU701
RF401
MA-60
1-63


CN202
CN201
IC501
IC101
IC801
IC802
CN218
MA-60
CN206
CN204
CN211
CN205
CN213
CN212
CN208
CN209
BZ501
CF801
RV501
IF702
IF701
L551
L751
L701
L702
L201
1-635-176
11
4
5
6
7
8
9
10
11
12
13

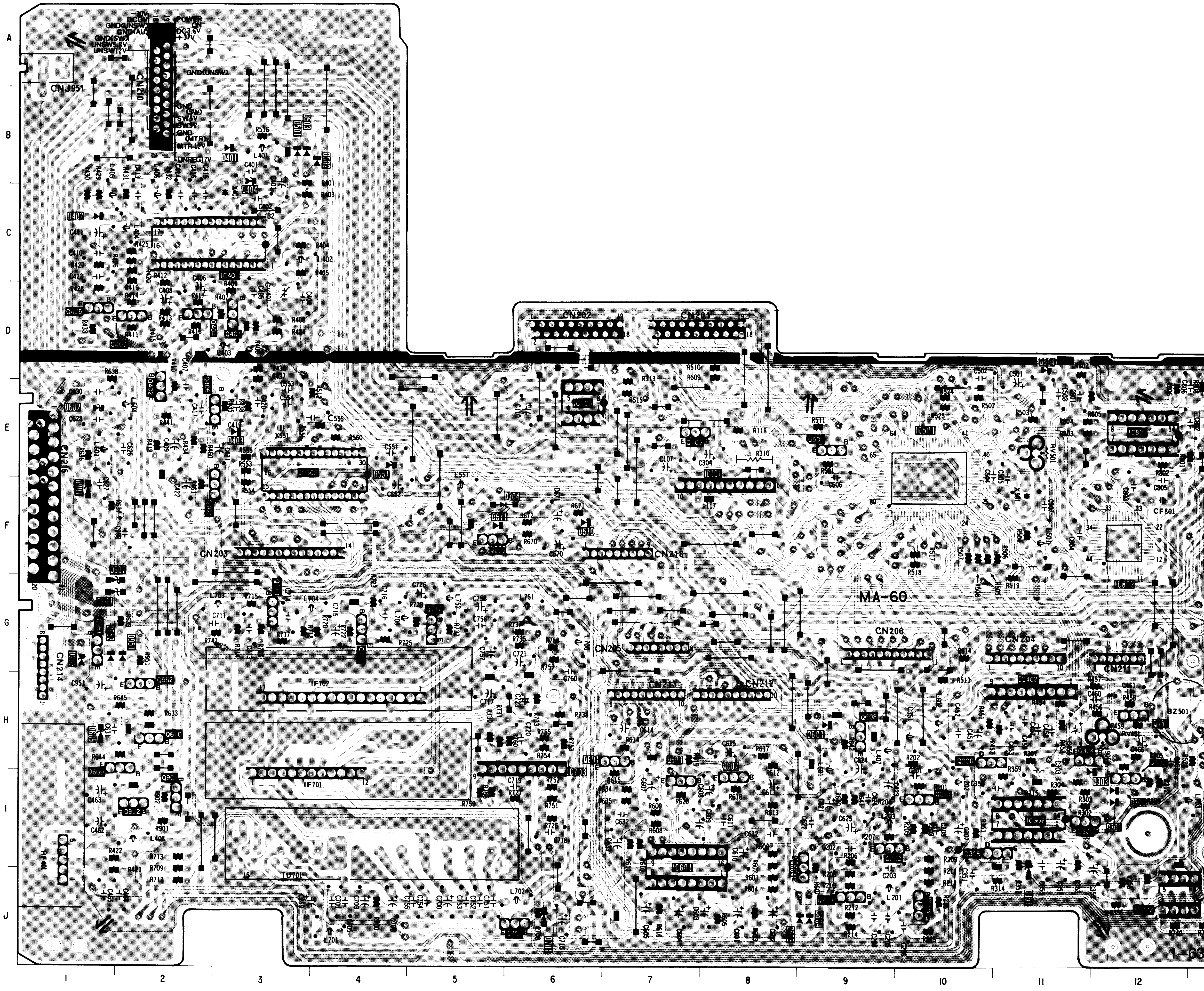
MA-60 (SERVO, SYSTEM CONTROL) PRINTED WIRING BOARD

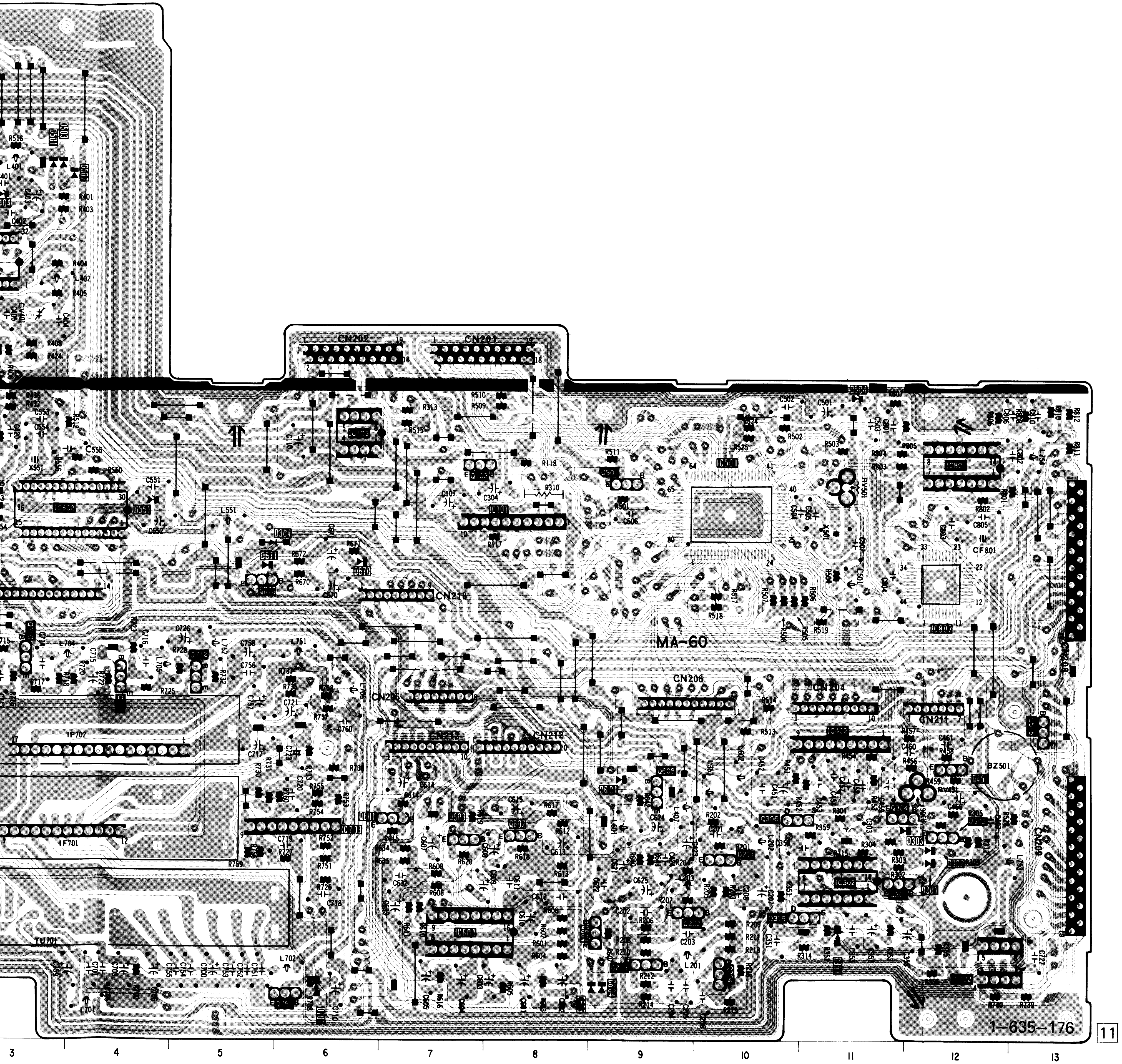
–Ref. No. MA-60 Board: 3,000 series–

MA-60 BOARD

D301	I-12	IC702	J-12
D302	I-12	IC801	E-12
D303	I-11	IC802	G-12
D304	F-5		
D351	J-11	Q103	E-7
D401	B-3	Q201	I-10
D402	C-1	Q202	I-10
D403	E-3	Q203	J-9
D404	C-3	Q204	J-10
D501	B-3	Q301	I-11
D502	B-3	Q302	I-12
D503	B-3	Q304	H-11
D504	E-11	Q401	D-3
D551	F-4	Q402	E-2
D601	H-9	Q403	D-1
D602	E-1	Q404	D-2
D603	J-8	Q405	D-1
D604	J-9	Q406	E-2
D670	F-6	Q407	F-2
D671	F-5	Q451	H-12
D701	J-6	Q501	E-9
D901	F-1	Q515	H-13
D902	G-1	Q601	H-7
D903	G-1	Q602	H-8
D951	G-2	Q603	H-7
D952	G-1	Q604	I-9
D953	G-1	Q608	H-9
		Q609	I-1
IC101	F-8	Q610	H-2
IC103	E-6	Q670	F-5
IC302	I-11	Q710	G-3
IC401	C-2	Q711	G-4
IC402	H-11	Q712	G-5
IC501	E-10	Q751	J-6
IC502	E-4	Q951	G-1
IC601	J-7	Q952	H-2

MA-60 BOARD


A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
9
10
11
12
CNJ951
CN210
POWER
GND(UNSW)
DC3.6V
+37V
GND(SW)
UNSW5.6V
UNSW12V
SW5V
SW3V
MTR 12V
UNREG17V
D401
IC401
CN202
CN201
CN216
CN203
CN214
IC502
X551
D551
D304
IC101
CN218
IC501
RV501
X501
CF801
IC802
MA-60
CN206
CN205
CN204
CN211
CN213
CN212
IF702
IF701
TU701
IC601
IC402
RF401
BZ501
RV451
1-63

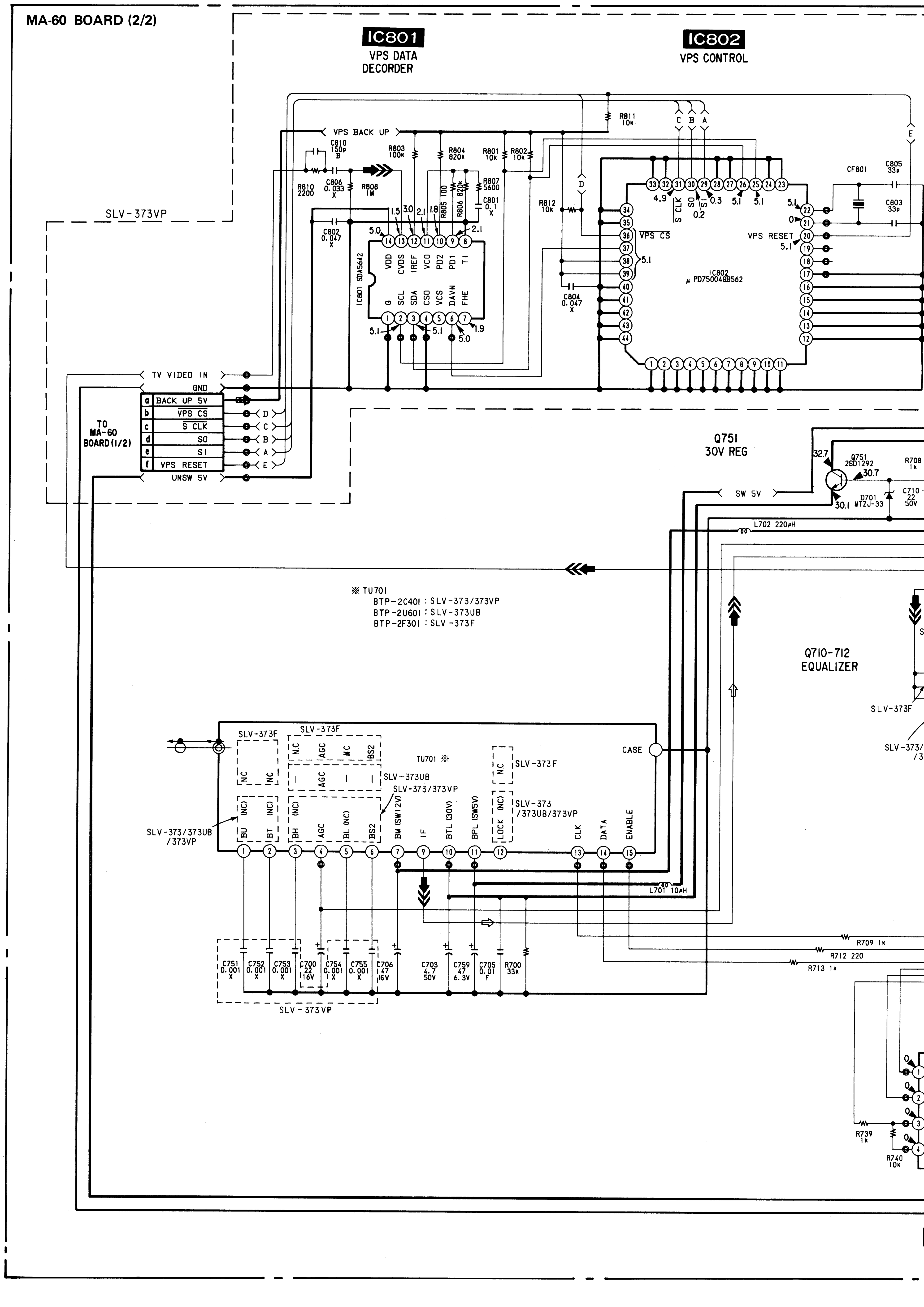

CN202
CN201
MA-60
CN206
CN204
CN205
CN211
CN212
CN210
CN208
CN209
IF702
IF701
TU701
BZ501
RV501
RV401
CF801
X501
X551
1-635-176
11
3
4
5
6
7
8
9
10
11
12
13

SERVO,SYSTEM CONTROL

SERVO,SYSTEM CONTROL

MA-60 (2/2) (SERVO, SYSTEM CONTROL) SCHEMATIC DIAGRAM

—Ref. No. MA60 Board: 3,000 series—

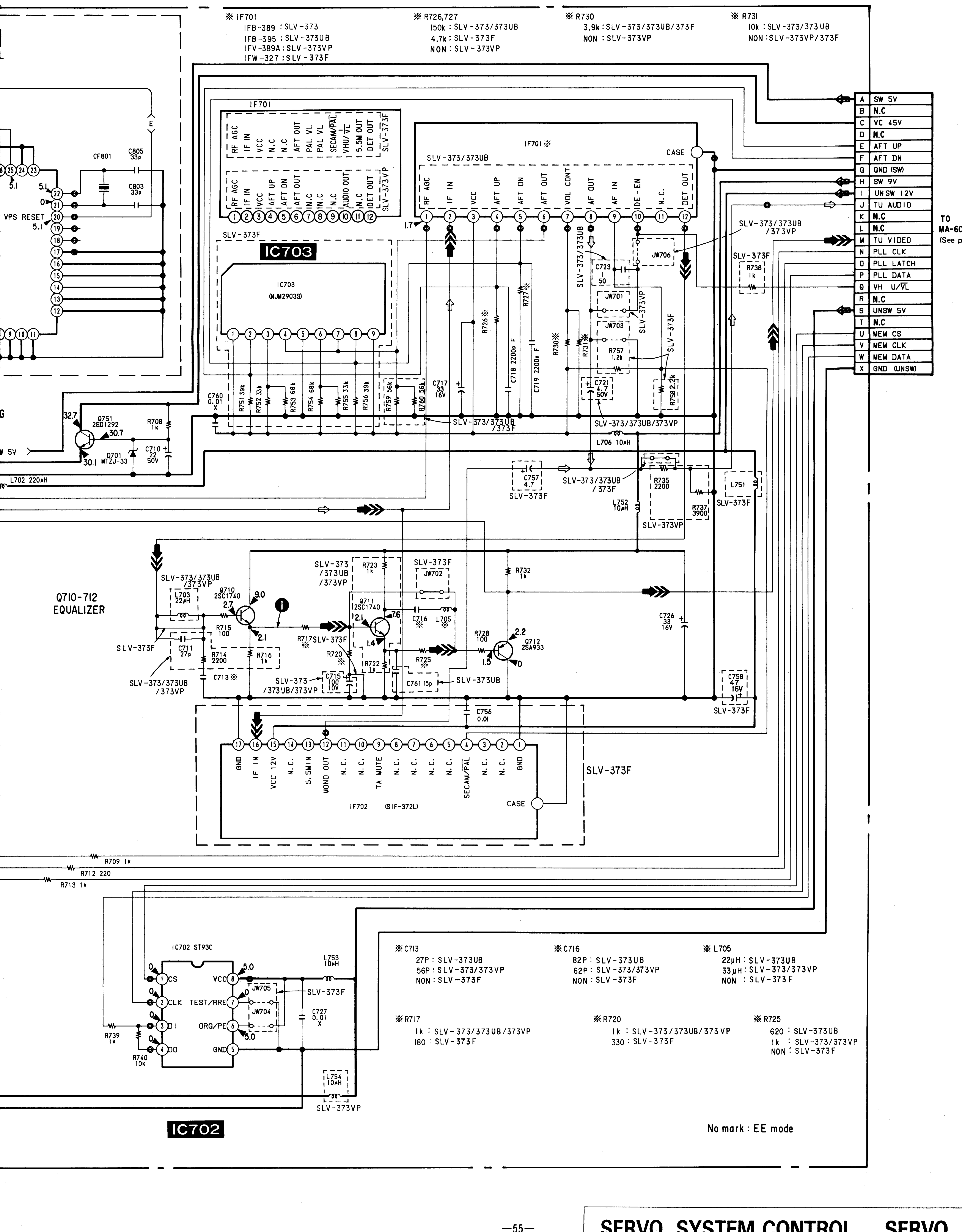

MA-60 BOARD (2/2)
IC801
VPS DATA DECORDER
IC802
VPS CONTROL
VPS BACK UP
C810 150p B
R803 100k
R804 820k
R801 10k
R802 10k
R811 10k
C B A
E
R810 2200
C806 0.033 X
R808 1M
R807 5600
C801 0.1 X
R805 100
R806 820k
C802 0.047 X
R812 10k
D
C804 0.047 X
CF801
C805 33p
C803 33p
IC801 SDA5642
VDD CVDS IREF VCO PD2 PD1 TI
G SCL SDA CSO VCS DAVN FHE
IC802 μPD75004GB562
VPS CS
VPS RESET
S CLK SO SI
SLV-373VP
TV VIDEO IN
GND
BACK UP 5V
VPS CS
S CLK
SO
SI
VPS RESET
UNSW 5V
TO MA-60 BOARD (1/2)
Q751 30V REG
Q751 2SD1292
R708 1k
D701 MTZJ-33
C710 22 50V
SW 5V
L702 220μH
※ TU701
BTP-2C401 : SLV-373/373VP
BTP-2U601 : SLV-373UB
BTP-2F301 : SLV-373F
Q710-712 EQUALIZER
SLV-373F
SLV-373UB
SLV-373/373VP
SLV-373/373UB/373VP
TU701 ※
CASE
NC AGC BS2
BU BT BH AGC BL (NC) BS2 BM (SW12V) IF BTL (30V) BPL (SW5V) LOCK (NC) CLK DATA ENABLE
L701 10μH
R709 1k
R712 220
R713 1k
C751 0.001 X
C752 0.001 X
C753 0.001 X
C700 22 16V
C754 0.001 X
C755 0.001 X
C706 47 16V
C703 4.7 50V
C759 47 6.3V
C705 0.01 F
R700 33k
SLV-373VP
R739 1k
R740 10k

※ IF701
IFB-389 : SLV-373
IFB-395 : SLV-373UB
IFV-389A : SLV-373VP
IFW-327 : SLV-373F

※ R726,727
150k : SLV-373/373UB
4.7k : SLV-373F
NON : SLV-373VP

※ R730
3.9k : SLV-373/373UB/373F
NON : SLV-373VP

※ R731
10k : SLV-373/373UB
NON : SLV-373VP/373F



IF701
RF AGC
IF IN
VCC
N.C
AFT OUT
PAL VL
SECAM/PAL
VHU/VL
5.5M OUT
DET OUT
SLV-373F
AFT UP
AFT DN
AUDIO OUT
SLV-373VP
IF701※
SLV-373/373UB
CASE
VOL CONT
AF OUT
AF IN
DE-EN
N.C.
IC703
(NJM2903S)
VPS RESET
CF801
C805 33p
C803 33p
Q751 2SD1292
R708 1k
D701 MTZJ-33
C710 22 50V
L702 220μH
C760 0.01
R751 39k
R752 33k
R753 68k
R754 68k
R755 33k
R756 39k
R759 56k
R760 56k
C717 33 16V
C718 2200p F
C719 2200p F
R726※
R727※
R730※
R731※
C723 1 50
JW706
JW701
JW703
R757 1.2k
C721 4.7 50V
R758 2.2k
R738 1k
L706 10μH
C757 4.7
R735 2200
L752 10μH
L751
R737 3900
SLV-373/373UB/373VP
A SW 5V
B N.C
C VC 45V
D N.C
E AFT UP
F AFT DN
G GND (SW)
H SW 9V
I UNSW 12V
J TU AUDIO
K N.C
L N.C
M TU VIDEO
N PLL CLK
O PLL LATCH
P PLL DATA
Q VH U/VL
R N.C
S UNSW 5V
T N.C
U MEM CS
V MEM CLK
W MEM DATA
X GND (UNSW)
TO MA-60
(See p
Q710-712 EQUALIZER
L703 22μH
Q710 2SC1740
R715 100
C711 27p
R714 2200
R716 1k
C713※
R723 1k
JW702
Q711 2SC1740
C716※
L705※
R717※
R720※
R722 1k
R725※
C715 100 10V
C761 15p
R728 100
Q712 2SA933
R732 1k
C726 33 16V
C758 47 16V
C756 0.01
IF702 (SIF-372L)
GND
IF IN
VCC 12V
5.5MIN
MONO OUT
TA MUTE
SECAM/PAL
R709 1k
R712 220
R713 1k
IC702 ST93C
CS
CLK
DI
DO
VCC
TEST/RRE
ORG/PE
GND
L753 10μH
JW705
JW704
C727 0.01
R739 1k
R740 10k
L754 10μH
IC702

※ C713
27P : SLV-373UB
56P : SLV-373/373VP
NON : SLV-373F

※ C716
82P : SLV-373UB
62P : SLV-373/373VP
NON : SLV-373F

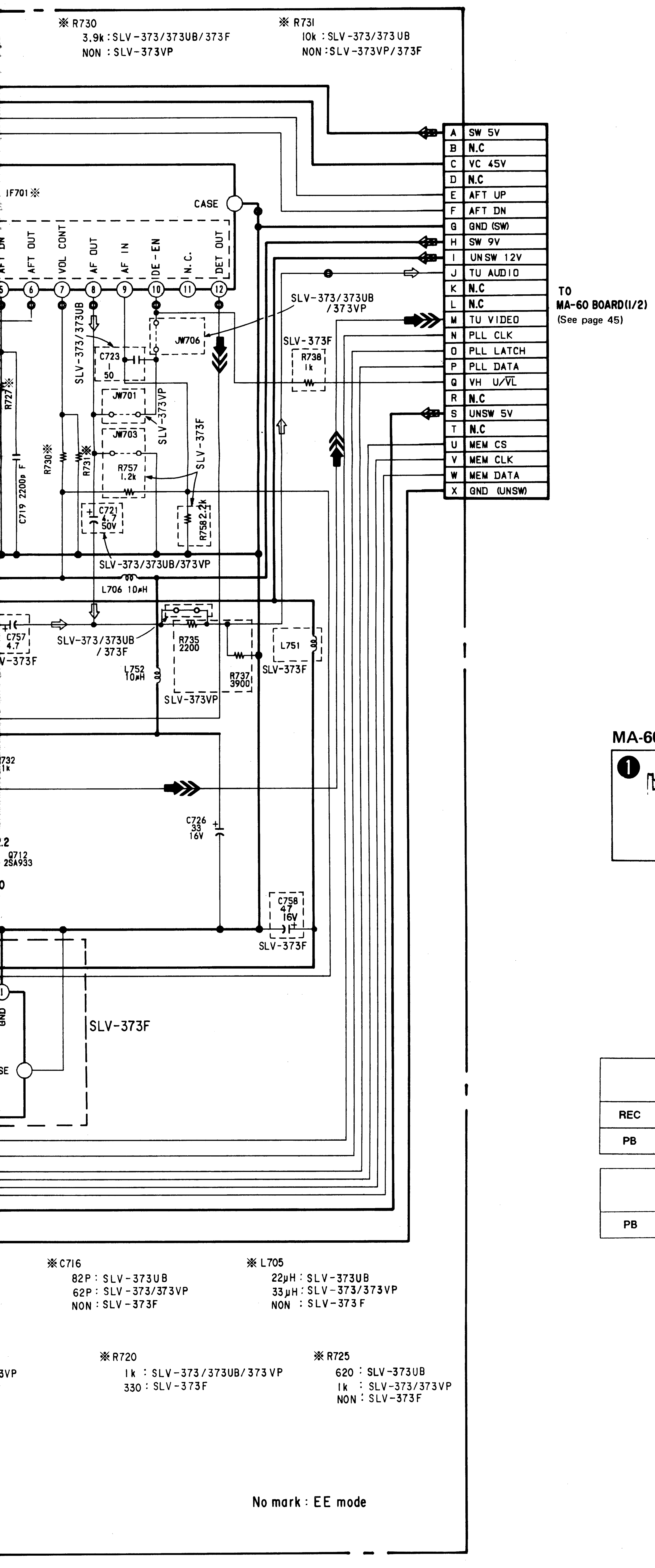
※ L705
22μH : SLV-373UB
33μH : SLV-373/373VP
NON : SLV-373F

※ R717
1k : SLV-373/373UB/373VP
180 : SLV-373F

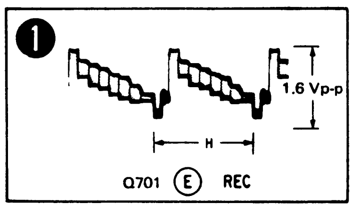
※ R720
1k : SLV-373/373UB/373VP
330 : SLV-373F

※ R725
620 : SLV-373UB
1k : SLV-373/373VP
NON : SLV-373F

No mark : EE mode


※ R730
3.9k : SLV-373/373UB/373F
NON : SLV-373VP
※ R731
10k : SLV-373/373UB
NON : SLV-373VP/373F
IF701 ※
CASE
AFT OUT
VOL CONT
AF OUT
AF IN
DE-EN
N.C.
DET OUT
SLV-373/373UB
/373VP
SLV-373/373UB
JW706
C723 50
JW701
JW703
SLV-373VP
SLV-373F
R738 1k
R727※
R730※
R731※
R757 1.2k
C719 2200p F
C721 4.7 50V
R758 2.2k
SLV-373/373UB/373VP
L706 10μH
C757 4.7
SLV-373F
SLV-373/373UB
/373F
R735 2200
L752 10μH
R737 3900
SLV-373VP
L751
SLV-373F
R732 1k
C726 33 16V
Q712 2SA933
C758 47 16V
SLV-373F
SLV-373F
GND
CASE
A SW 5V
B N.C
C VC 45V
D N.C
E AFT UP
F AFT DN
G GND (SW)
H SW 9V
I UNSW 12V
J TU AUDIO
K N.C
L N.C
M TU VIDEO
N PLL CLK
O PLL LATCH
P PLL DATA
Q VH U/VL
R N.C
S UNSW 5V
T N.C
U MEM CS
V MEM CLK
W MEM DATA
X GND (UNSW)
TO
MA-60 BOARD(1/2)
(See page 45)
※C716
82P : SLV-373UB
62P : SLV-373/373VP
NON : SLV-373F
※ L705
22μH : SLV-373UB
33μH : SLV-373/373VP
NON : SLV-373F
3VP
※ R720
1k : SLV-373/373UB/373VP
330 : SLV-373F
※ R725
620 : SLV-373UB
1k : SLV-373/373VP
NON : SLV-373F
No mark : EE mode

MA-60 BOARD



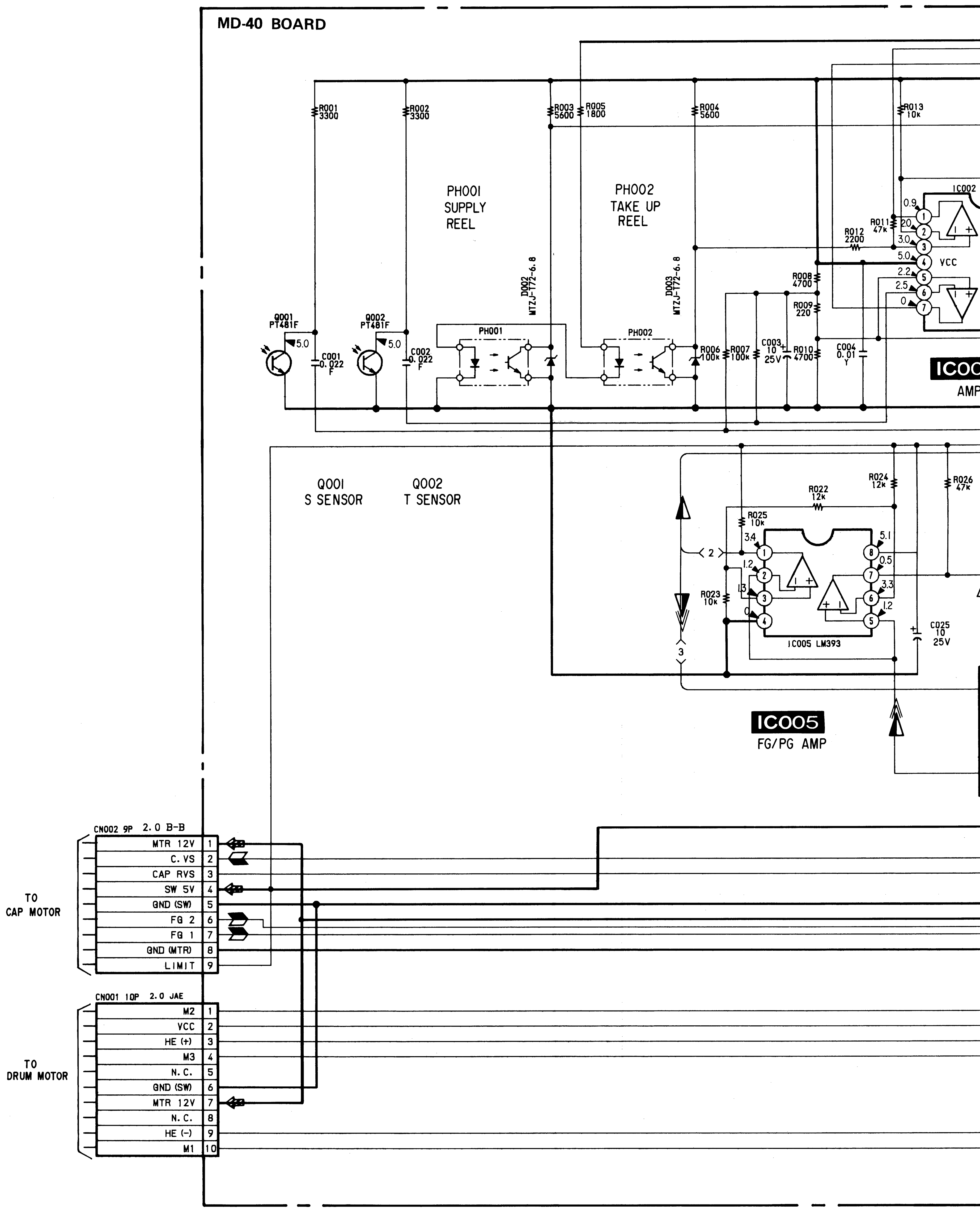
	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC			➡>>
PB			

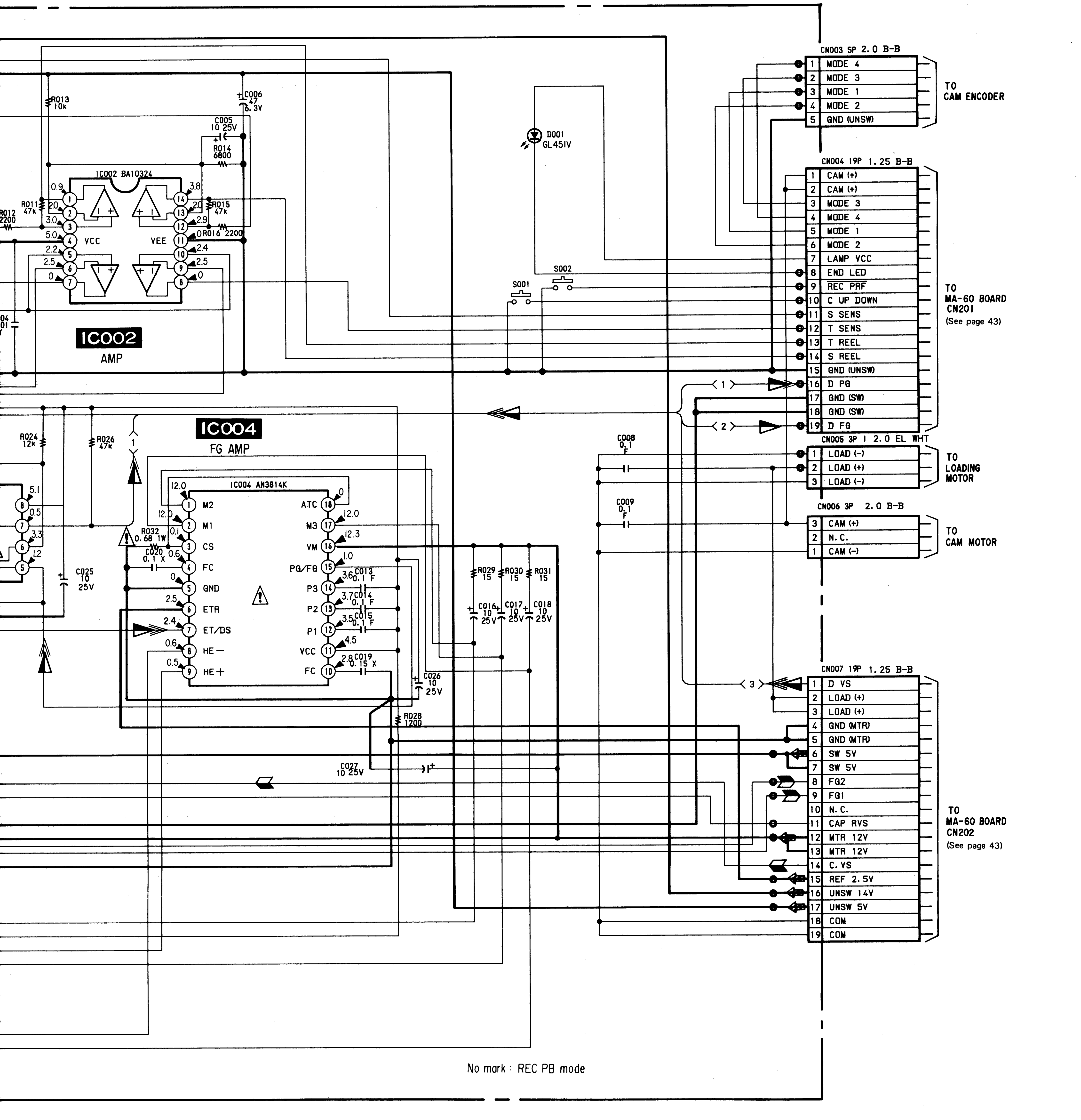
	AUDIO
PB	⇨

SERVO, SYSTEM CONTROL   SERVO, SYSTEM CONTROL

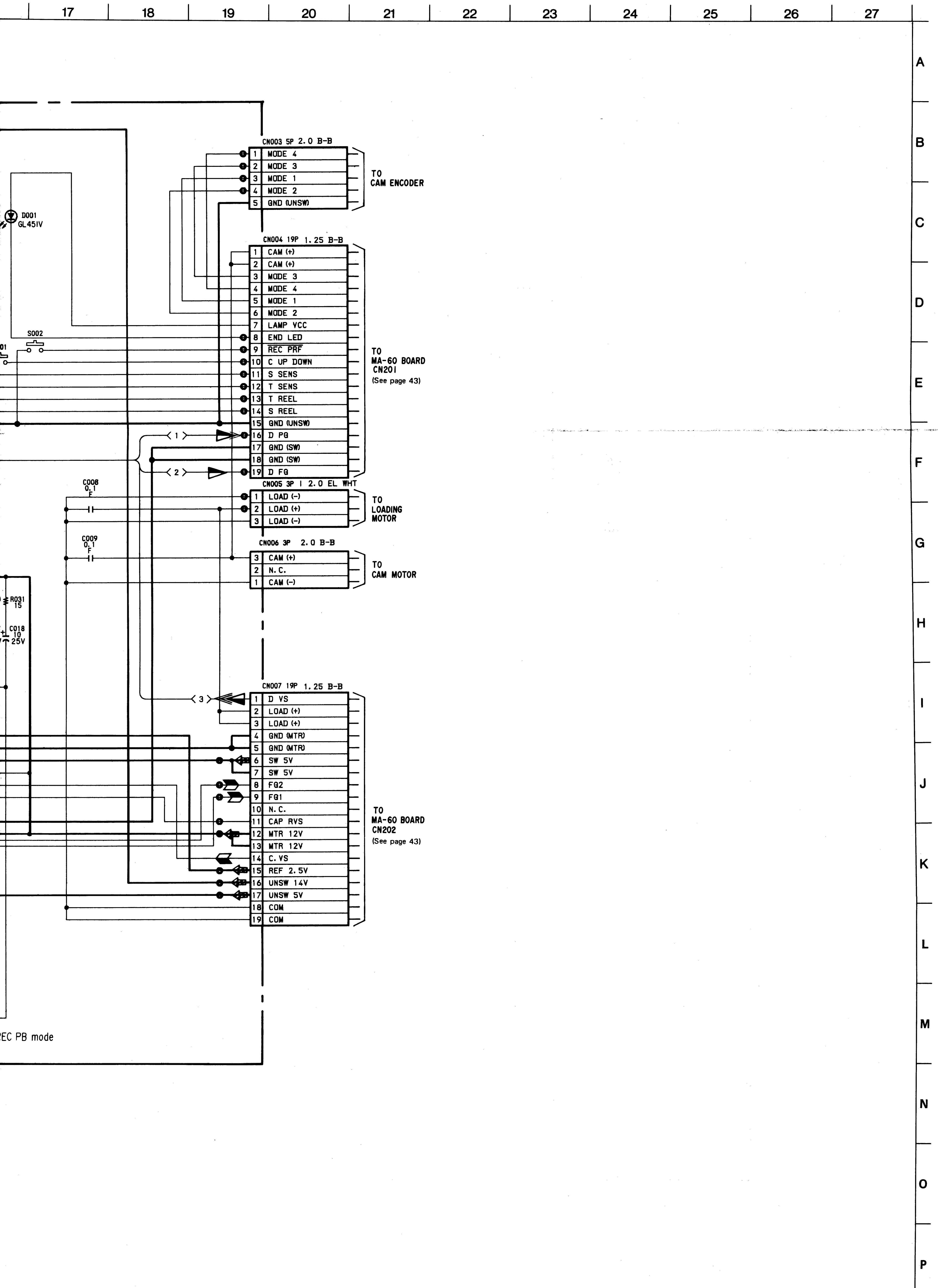
MD-40 (MECHANISM DRIVE) SCHEMATIC DIAGRAM

—Ref. No. MD-40 Board: 4,000 series—


MD-40 BOARD
R001 3300
R002 3300
R003 5600
R005 1800
R004 5600
R013 10k
PH001 SUPPLY REEL
PH002 TAKE UP REEL
D002 MTZJ-T72-6.8
D003 MTZJ-T72-6.8
Q001 PT481F
Q002 PT481F
5.0
C001 0.022 F
C002 0.022 F
PH001
PH002
R006 100k
R007 100k
C003 10 25V
R010 4700
R008 4700
R009 220
C004 0.01 Y
R011 47k
R012 2200
IC002
VCC
0.9
2.0
3.0
5.0
2.2
2.5
0
AMP
Q001 S SENSOR
Q002 T SENSOR
R022 12k
R024 12k
R026 47k
R025 10k
R023 10k
3.4
1.2
1.3
0
5.1
0.5
3.3
1.2
IC005 LM393
C025 10 25V
2
3
IC005
FG/PG AMP
CN002 9P 2.0 B-B
MTR 12V
C.VS
CAP RVS
SW 5V
GND (SW)
FG 2
FG 1
GND (MTR)
LIMIT
TO CAP MOTOR
CN001 10P 2.0 JAE
M2
VCC
HE (+)
M3
N.C.
GND (SW)
MTR 12V
N.C.
HE (-)
M1
TO DRUM MOTOR


IC002
AMP
IC002 BA10324
VCC
VEE
R013 10k
C006 47 6.3V
C005 10 25V
R014 6800
R011 47k
R012 2200
R015 47k
R016 2200
IC004
FG AMP
IC004 AN3814K
M2
M1
CS
FC
GND
ETR
ET/DS
HE−
HE+
ATC
M3
VM
PG/FG
P3
P2
P1
VCC
FC
R024 12k
R026 47k
R032 0.68 1W
C020 0.1 X
C025 10 25V
C013 0.1 F
C014 0.1 F
C015 0.1 F
C019 0.15 X
C026 10 25V
R028 1200
C027 10 25V
R029 15
R030 15
R031 15
C016 10 25V
C017 10 25V
C018 10 25V
D001 GL451V
S001
S002
C008 0.1 F
C009 0.1 F
CN003 5P 2.0 B-B
1 MODE 4
2 MODE 3
3 MODE 1
4 MODE 2
5 GND (UNSW)
TO CAM ENCODER
CN004 19P 1.25 B-B
1 CAM (+)
2 CAM (+)
3 MODE 3
4 MODE 4
5 MODE 1
6 MODE 2
7 LAMP VCC
8 END LED
9 REC PRF
10 C UP DOWN
11 S SENS
12 T SENS
13 T REEL
14 S REEL
15 GND (UNSW)
16 D PG
17 GND (SW)
18 GND (SW)
19 D FG
TO MA-60 BOARD CN201 (See page 43)
CN005 3P I 2.0 EL WHT
1 LOAD (−)
2 LOAD (+)
3 LOAD (−)
TO LOADING MOTOR
CN006 3P 2.0 B-B
3 CAM (+)
2 N.C.
1 CAM (−)
TO CAM MOTOR
CN007 19P 1.25 B-B
1 D VS
2 LOAD (+)
3 LOAD (+)
4 GND (MTR)
5 GND (MTR)
6 SW 5V
7 SW 5V
8 FG2
9 FG1
10 N.C.
11 CAP RVS
12 MTR 12V
13 MTR 12V
14 C.VS
15 REF 2.5V
16 UNSW 14V
17 UNSW 5V
18 COM
19 COM
TO MA-60 BOARD CN202 (See page 43)
1
2
3

No mark : REC PB mode

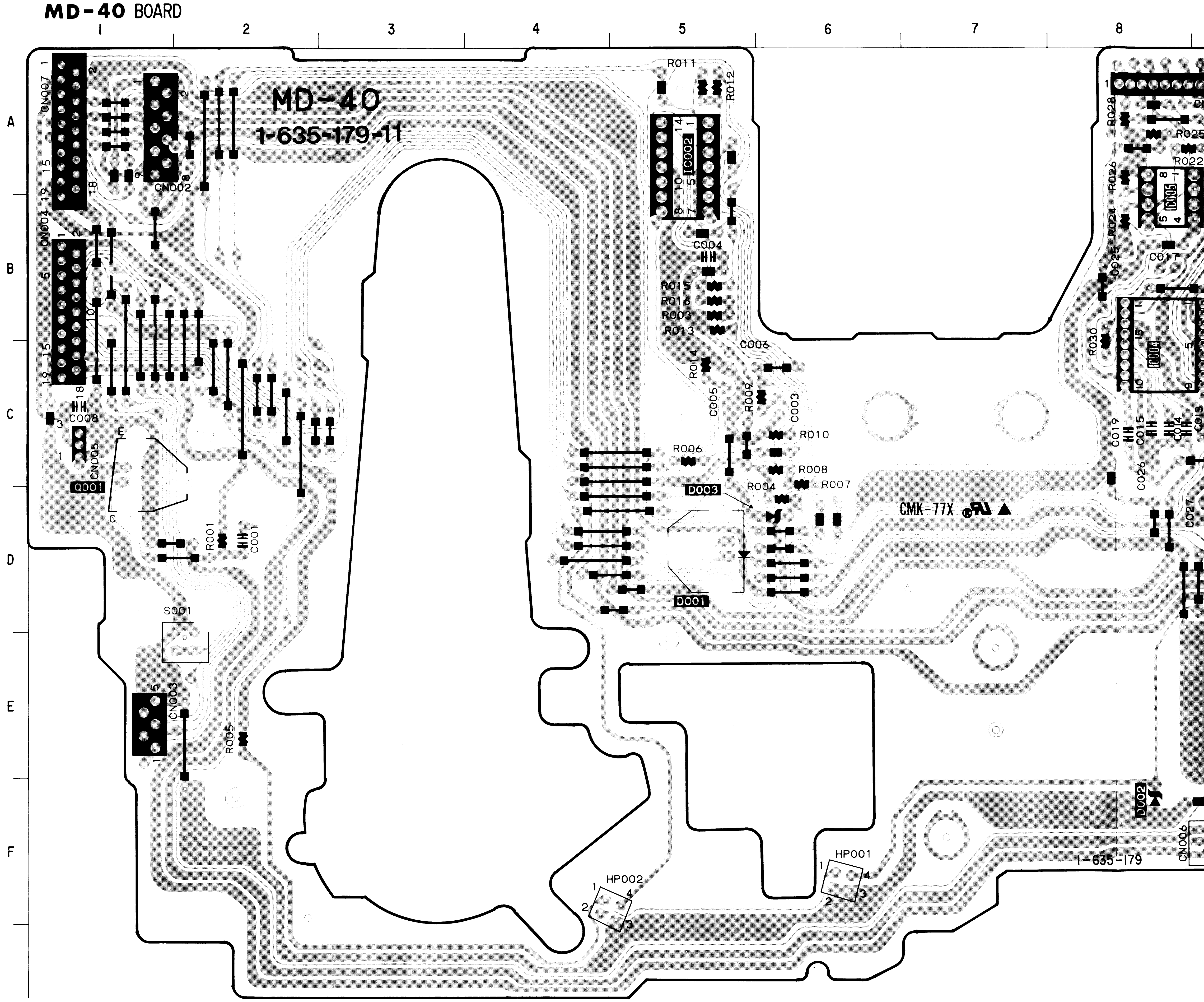
17
18
19
20
21
22
23
24
25
26
27
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
D001
GL451V
S002
R031
15
C018
10
25V
C008
0.1
F
C009
0.1
F
EC PB mode
CN003 5P 2.0 B-B
1 MODE 4
2 MODE 3
3 MODE 1
4 MODE 2
5 GND (UNSW)
TO
CAM ENCODER
CN004 19P 1.25 B-B
1 CAM (+)
2 CAM (+)
3 MODE 3
4 MODE 4
5 MODE 1
6 MODE 2
7 LAMP VCC
8 END LED
9 REC PRF
10 C UP DOWN
11 S SENS
12 T SENS
13 T REEL
14 S REEL
15 GND (UNSW)
16 D PG
17 GND (SW)
18 GND (SW)
19 D FG
TO
MA-60 BOARD
CN201
(See page 43)
‹1›
‹2›
CN005 3P I 2.0 EL WHT
1 LOAD (-)
2 LOAD (+)
3 LOAD (-)
TO
LOADING
MOTOR
CN006 3P 2.0 B-B
3 CAM (+)
2 N.C.
1 CAM (-)
TO
CAM MOTOR
CN007 19P 1.25 B-B
‹3›
1 D VS
2 LOAD (+)
3 LOAD (+)
4 GND (MTR)
5 GND (MTR)
6 SW 5V
7 SW 5V
8 FG2
9 FG1
10 N.C.
11 CAP RVS
12 MTR 12V
13 MTR 12V
14 C.VS
15 REF 2.5V
16 UNSW 14V
17 UNSW 5V
18 COM
19 COM
TO
MA-60 BOARD
CN202
(See page 43)

MD-40 (MECHANISM DRIVE) PRINTED WIRING BOARD

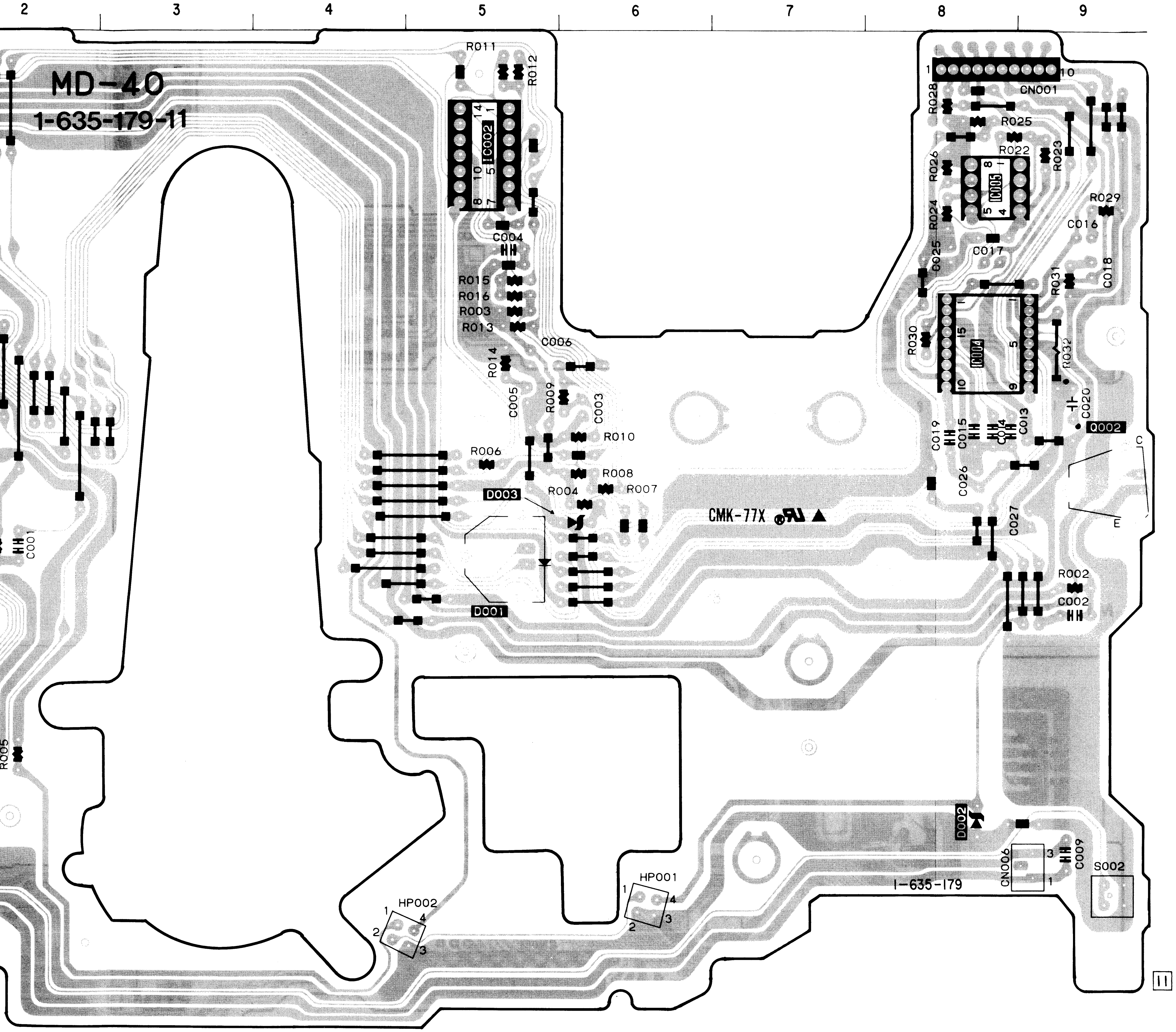
–Ref. No. MD-40 Board: 4,000 series–

MD-40 BOARD

D001	D-5
D002	F-8
D003	D-6
IC002	B-5
IC004	C-8
IC005	B-8
Q001	C-1
Q002	D-9


MD-40 BOARD
1
2
3
4
5
6
7
8
A
B
C
D
E
F
MD-40
1-635-179-11
CN007
CN002
CN004
CN005
CN003
CN006
Q001
C008
R001
C001
S001
R005
R011
R012
IC002
C004
R015
R016
R003
R013
R014
C006
C005
R009
C003
R010
R006
R008
R004
R007
D003
D001
D002
CMK-77X
HP001
HP002
R028
R025
R022
R026
R024
IC005
C025
C017
R030
IC004
C019
C015
C014
C013
C026
C027
1-635-179

MECHANISM DRIVE MECHANISM DRIVE


2
3
4
5
6
7
8
9
MD-40
1-635-179-11
R011
R012
IC002
14
1
10
5
8
7
C004
R015
R016
R003
R013
C006
R014
C005
R009
C003
R010
R006
R008
R007
R004
D003
D001
C001
R005
CMK-77X
CN001
1
10
R028
R025
R022
R026
R023
IC005
8
5
4
R024
R029
C016
C025
C017
R031
C018
R030
IC004
15
10
5
9
R032
C020
Q002
C019
C015
C014
C013
C
E
C026
C027
R002
C002
D002
CN006
3
1
C009
S002
1-635-179
HP001
1
2
3
4
HP002
1
2
3
4
11

MF-95 (FUNCTION, LINE IN 2), MF-96 (FOW/RVS SWITCH), MF-97 (MODE CONTROL, INDICATOR) PRINTED WIRING BOARDS

–Ref. No. MF-95, MF-96, MF-97 Boards: 6,000 series–

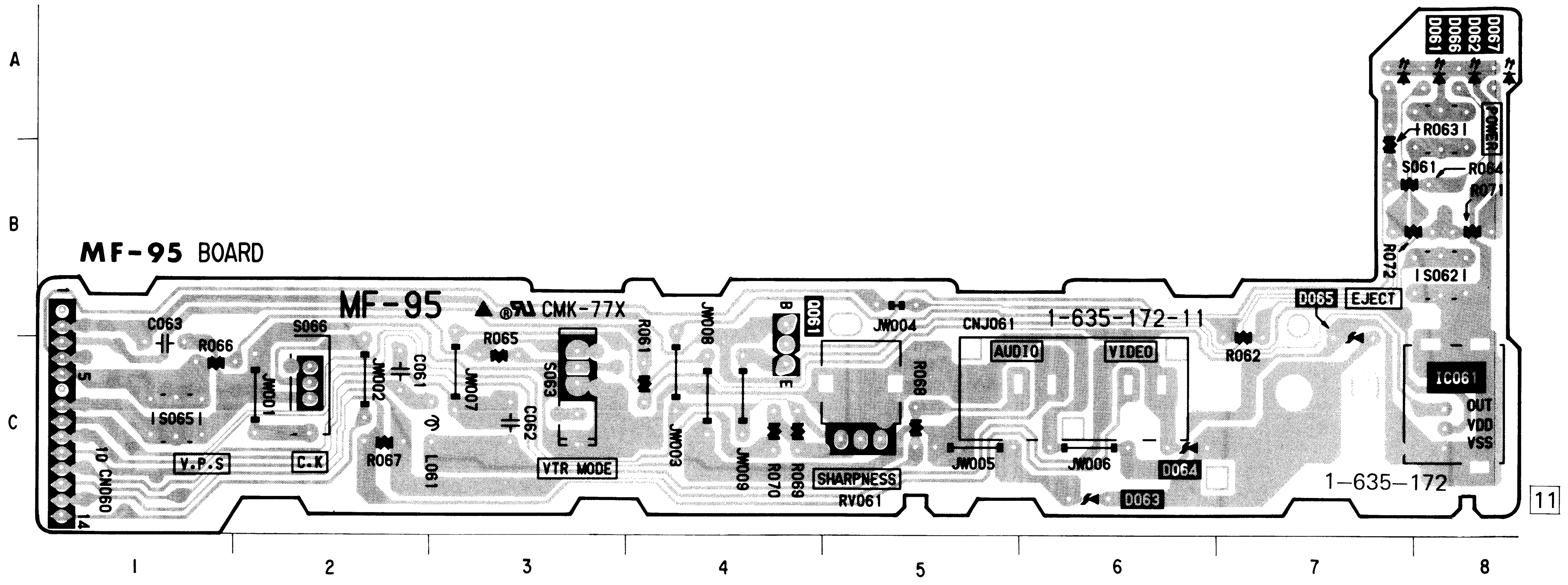
MF-95 BOARD

D061	A-8
D062	C-6
D063	C-6
D064	C-6
D065	C-7
D066	A-8
D067	A-8
IC061	C-8
Q061	C-4

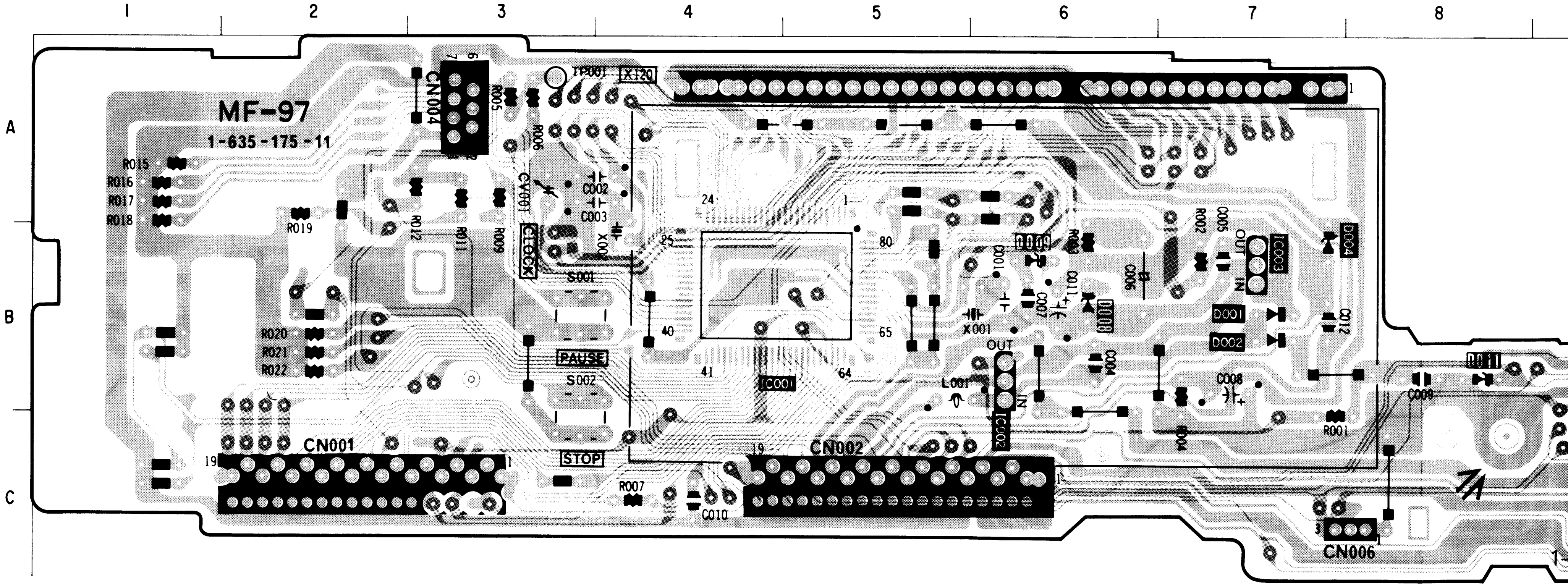
MF-97 BOARD

D001	B-7
D002	B-7
D004	B-8
D010	B-9
D011	B-8
IC001	B-4
IC002	B-6
IC003	B-7

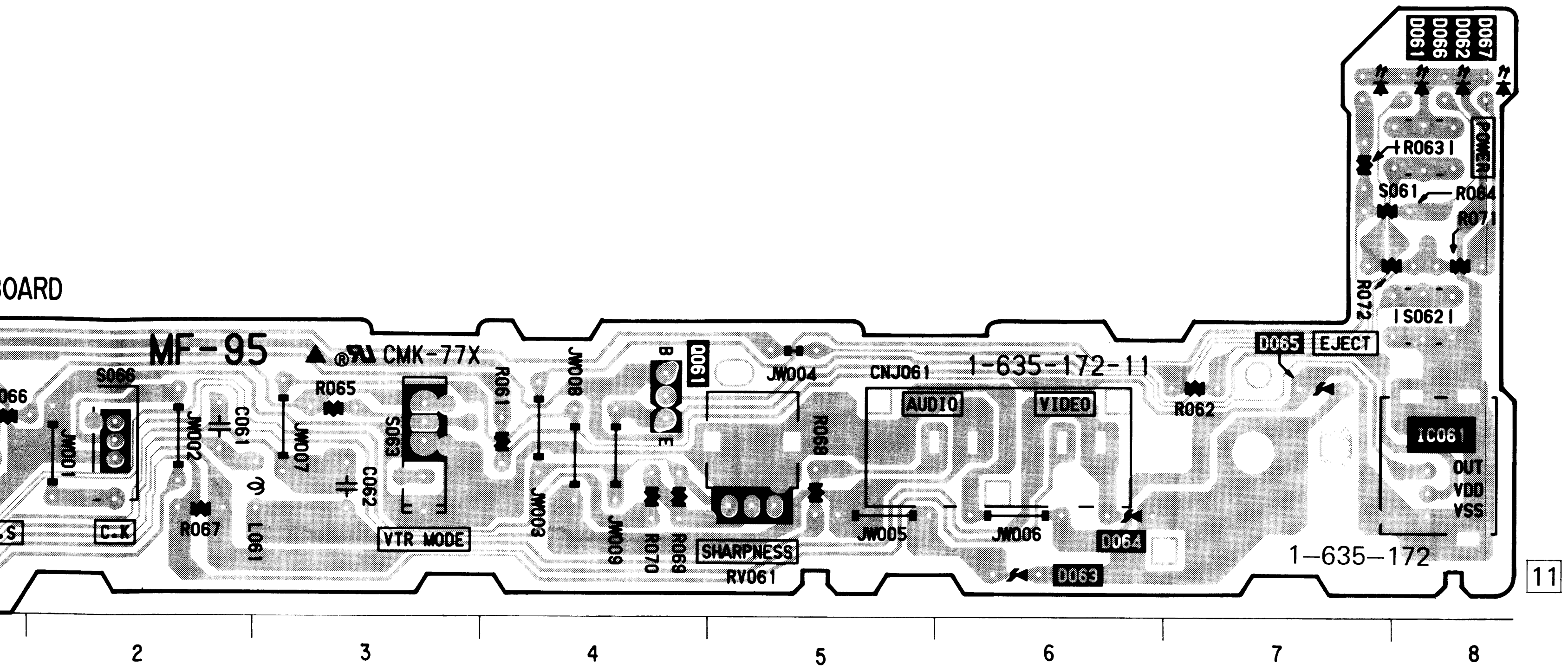
MF-95 BOARD


A
B
C
1
2
3
4
5
6
7
8
MF-95
CMK-77X
1-635-172-11
1-635-172
11
CN060
5
10
14
C063
R066
S066
S065
JW001
JW002
C061
JW007
C062
R065
S063
L061
R067
V.P.S
C.K
VTR MODE
R061
JW008
JW003
JW009
D061
B
E
JW004
R068
R070
R069
SHARPNESS
RV061
CNJ061
AUDIO
VIDEO
JW005
JW006
D064
D063
R062
D065
EJECT
IC061
OUT
VDD
VSS
R063
S061
R064
R071
R072
S062
POWER
D067
D062
D066
D061

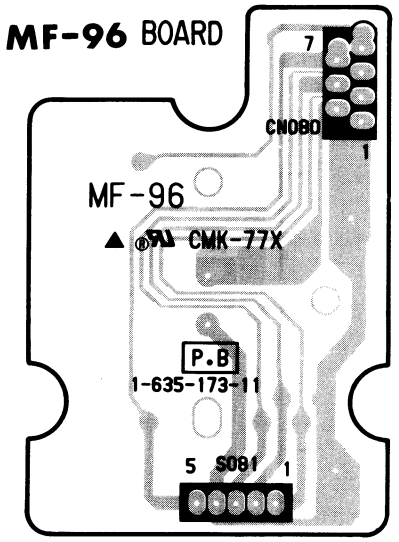
MF-97 BOARD


1
2
3
4
5
6
7
8
A
B
C
MF-97
1-635-175-11
R015
R016
R017
R018
R019
R012
R011
R009
CN004
R005
R006
TP001
X120
CV001
C002
C003
X002
CLOCK
S001
PAUSE
S002
STOP
R020
R021
R022
CN001
19
1
R007
C010
IC001
24
25
40
41
64
65
80
CN002
C001
X001
D009
D010
R003
C011
C007
D008
C004
L001
OUT
IN
IC002
R002
C005
C006
IC003
D004
D001
D002
C012
C008
R004
R001
C009
D011
CN006
3

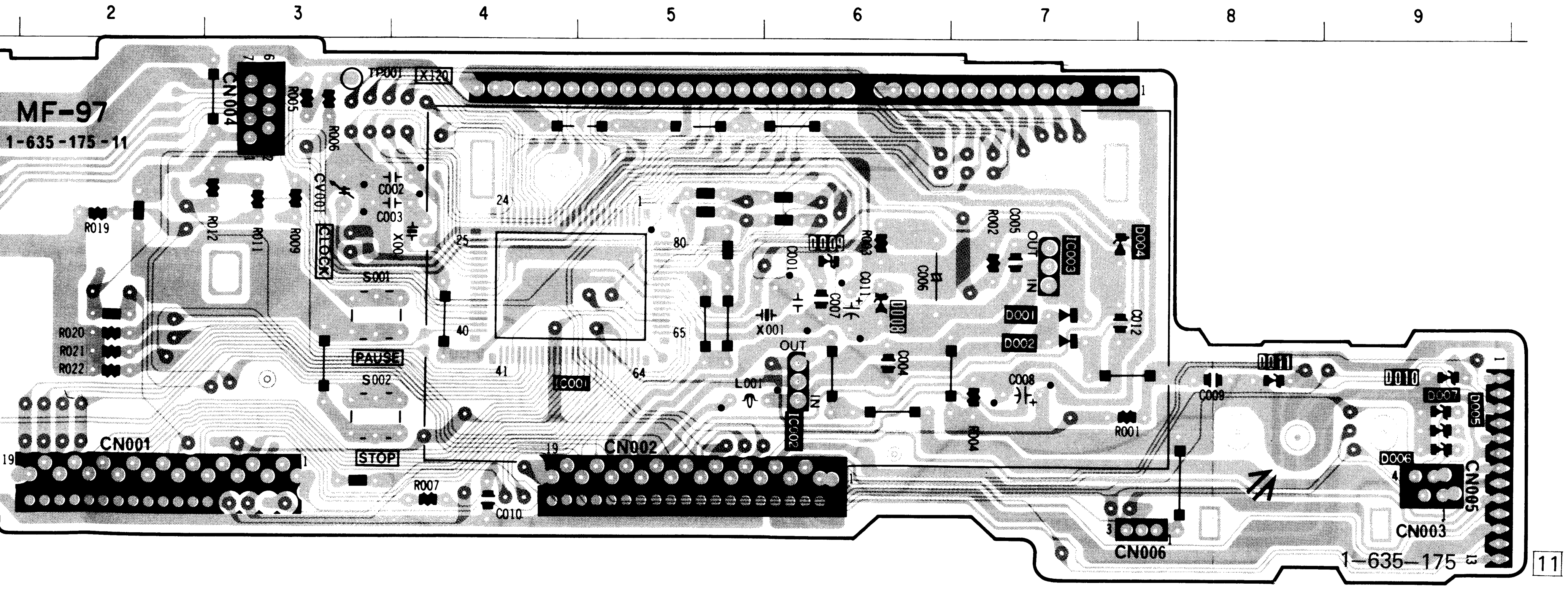
OARD


MF-95
CMK-77X
1-635-172-11
1-635-172
D061
D066
D062
D067
POWER
R0631
S061
R064
R071
R072
S062
D065
EJECT
IC061
OUT
VDD
VSS
S066
JW001
JW002
C061
R065
JW007
S063
C062
R067
L061
VTR MODE
C.K
R061
JW008
JW003
JW009
R070
R069
D061
JW004
R068
SHARPNESS
RV061
CNJ061
AUDIO
VIDEO
JW005
JW006
D064
D063
R062
11
2
3
4
5
6
7
8

MF-96 BOARD


MF-96
CMK-77X
CN080
7
1
P.B
1-635-173-11
S081
5
1

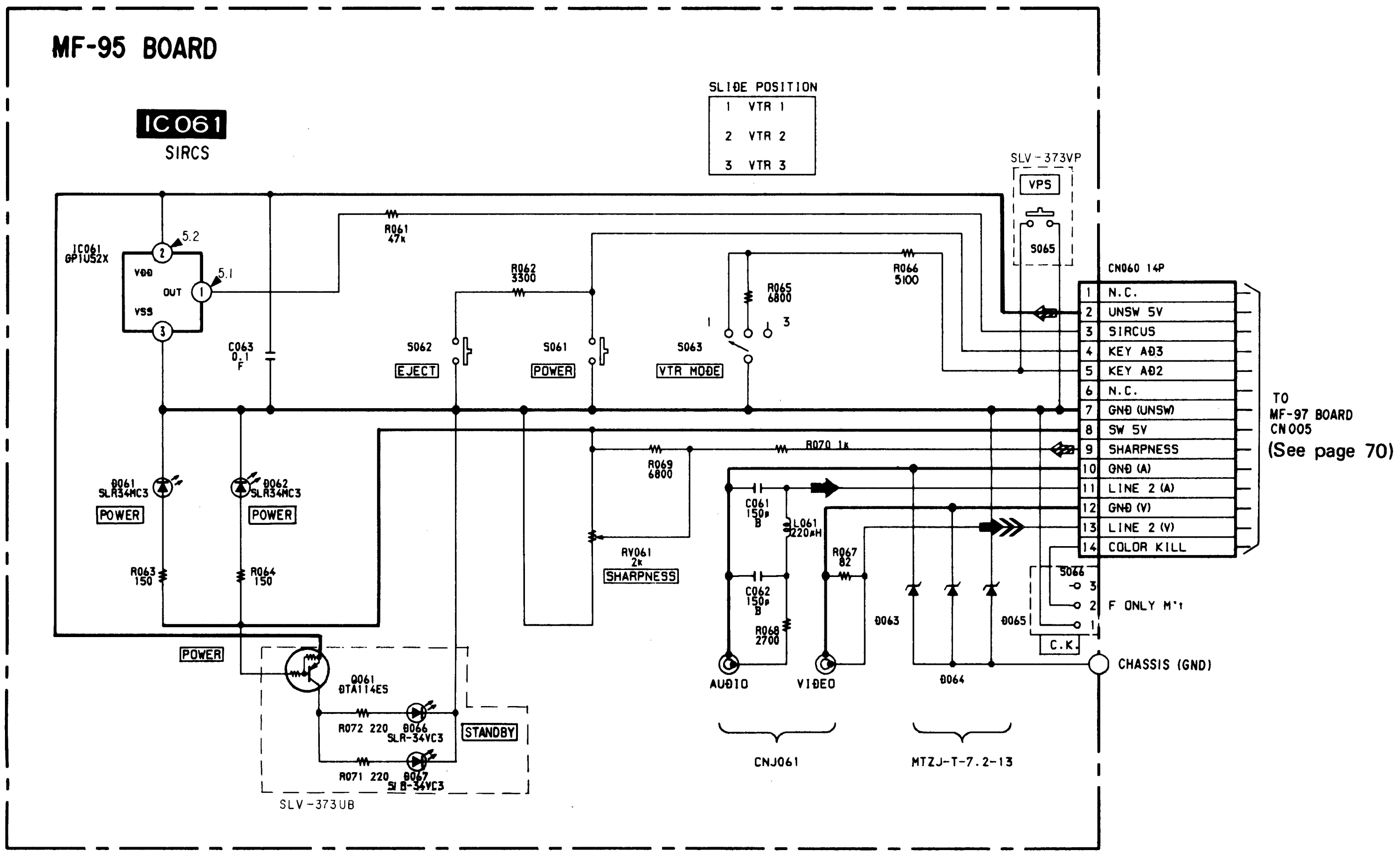
RD

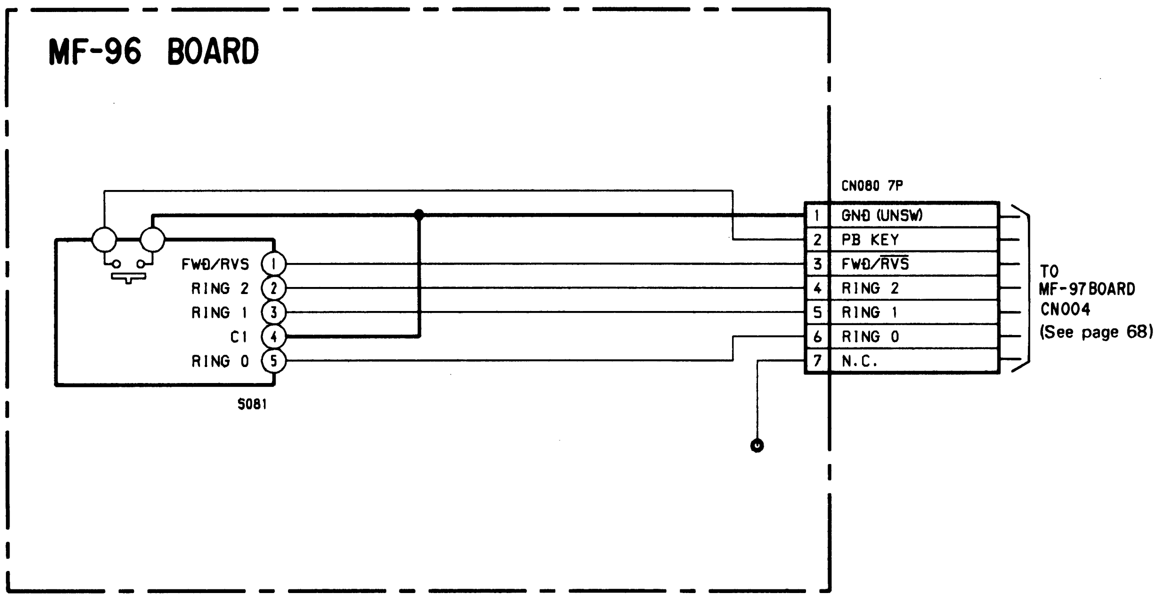

2
3
4
5
6
7
8
9
MF-97
1-635-175-11
1-635-175
CN004
R005
R006
TP001
X120
CV001
C002
C003
X001
R019
R012
R011
R009
CLOCK
S001
PAUSE
S002
STOP
R020
R021
R022
CN001
R007
C010
IC001
CN002
24
25
1
80
40
41
65
64
D009
D001
C011
C007
R003
C006
D008
X001
L001
OUT
IN
IC002
C004
R002
C005
OUT
IC003
IN
D004
D001
D002
C012
C008
R004
R001
C009
D011
D010
D007
D005
D006
CN005
CN003
CN006
11

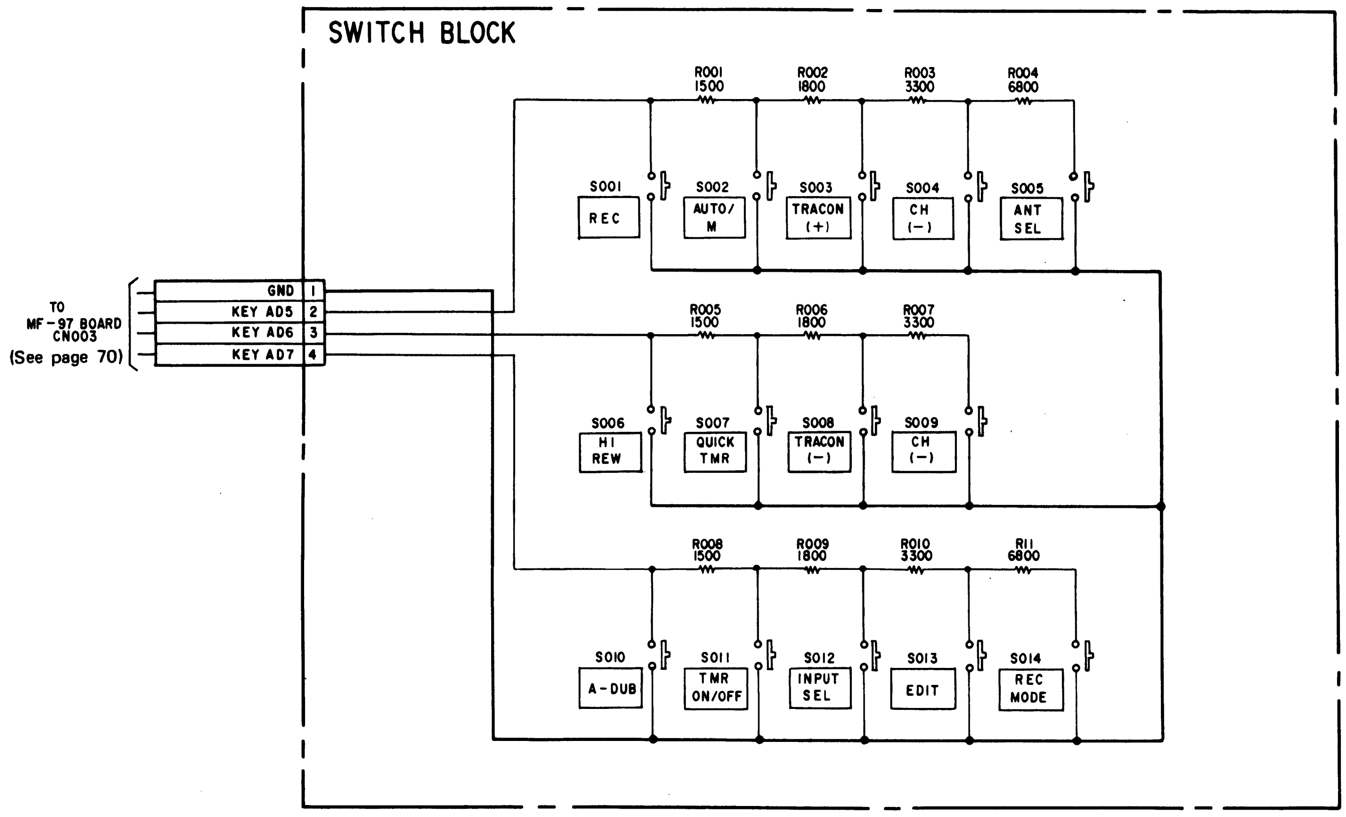
FUNCTION FUNCTION

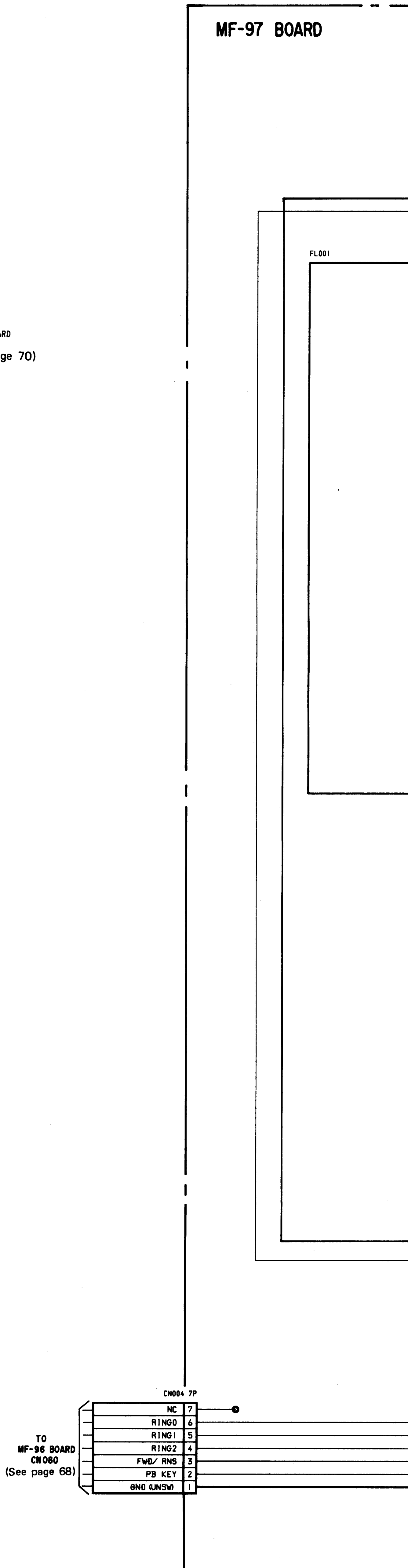
MF-95 (FUNCTION, LINE IN 2), MF-96 (FOW/RVS SWITCH), MF-97 (MODE CONTROL, INDICATOR) SCHEMATIC DIAGRAMS

–Ref. No. MF-95, MF-96, MF-97 Boards: 6,000 series–


MF-95 BOARD
IC061
SIRCS
SLIDE POSITION
1 VTR 1
2 VTR 2
3 VTR 3
SLV-373VP
VPS
S065
IC061
GP1U52X
VDD
OUT
VSS
5.2
5.1
R061
47k
R062
3300
R065
6800
R066
5100
C063
0.1
F
S062
EJECT
S061
POWER
S063
VTR MODE
CN060 14P
1 N.C.
2 UNSW 5V
3 SIRCUS
4 KEY AD3
5 KEY AD2
6 N.C.
7 GND (UNSW)
8 SW 5V
9 SHARPNESS
10 GND (A)
11 LINE 2 (A)
12 GND (V)
13 LINE 2 (V)
14 COLOR KILL
TO
MF-97 BOARD
CN005
(See page 70)
R069
6800
R070 1k
D061
SLR34MC3
POWER
D062
SLR34MC3
POWER
R063
150
R064
150
RV061
2k
SHARPNESS
C061
150p
B
L061
220μH
C062
150p
B
R067
82
R068
2700
D063
D065
S066
F ONLY M't
C.K.
CHASSIS (GND)
POWER
Q061
DTA114ES
R072 220
D066
SLR-34VC3
STANDBY
R071 220
D067
SLB-34VC3
SLV-373UB
AUDIO
VIDEO
D064
CNJ061
MTZJ-T-7.2-13


MF-96 BOARD
FWD/RVS
RING 2
RING 1
CI
RING 0
S081
CN080 7P
1 GND (UNSW)
2 PB KEY
3 FWD/RVS
4 RING 2
5 RING 1
6 RING 0
7 N.C.
TO
MF-97BOARD
CN004
(See page 68)

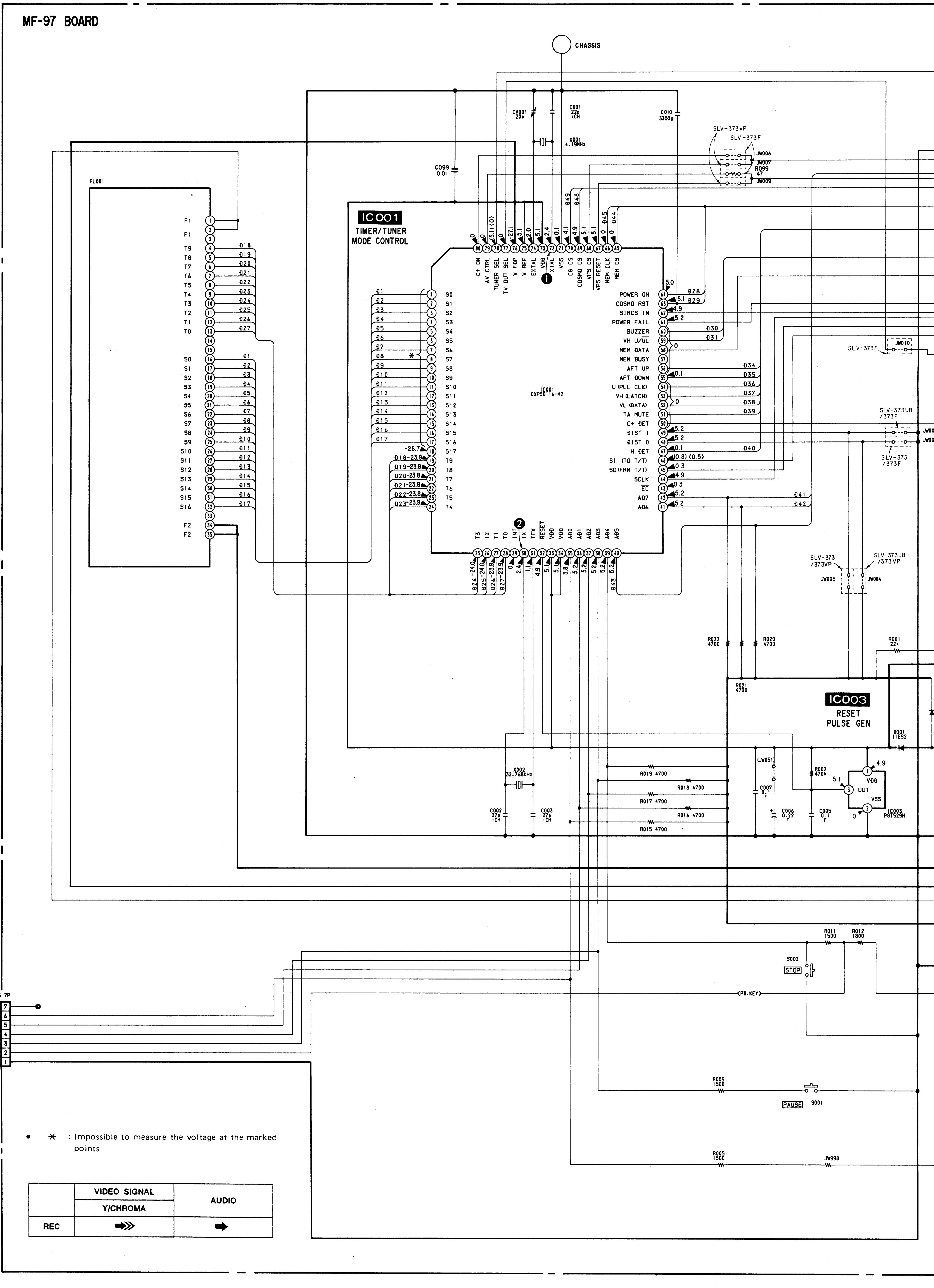

SWITCH BLOCK
R001
1500
R002
1800
R003
3300
R004
6800
S001
REC
S002
AUTO/M
S003
TRACON (+)
S004
CH (–)
S005
ANT SEL
TO
MF-97 BOARD
CN003
(See page 70)
GND 1
KEY AD5 2
KEY AD6 3
KEY AD7 4
R005
1500
R006
1800
R007
3300
S006
HI REW
S007
QUICK TMR
S008
TRACON (–)
S009
CH (–)
R008
1500
R009
1800
R010
3300
R11
6800
S010
A-DUB
S011
TMR ON/OFF
S012
INPUT SEL
S013
EDIT
S014
REC MODE


MF-97 BOARD
FL001
CN004 7P
NC 7
RING0 6
RING1 5
RING2 4
FWD/ RNS 3
PB KEY 2
GND (UNSW) 1
TO
MF-96 BOARD
CN080
(See page 68)

- ✳ : Impossible to measur
points.

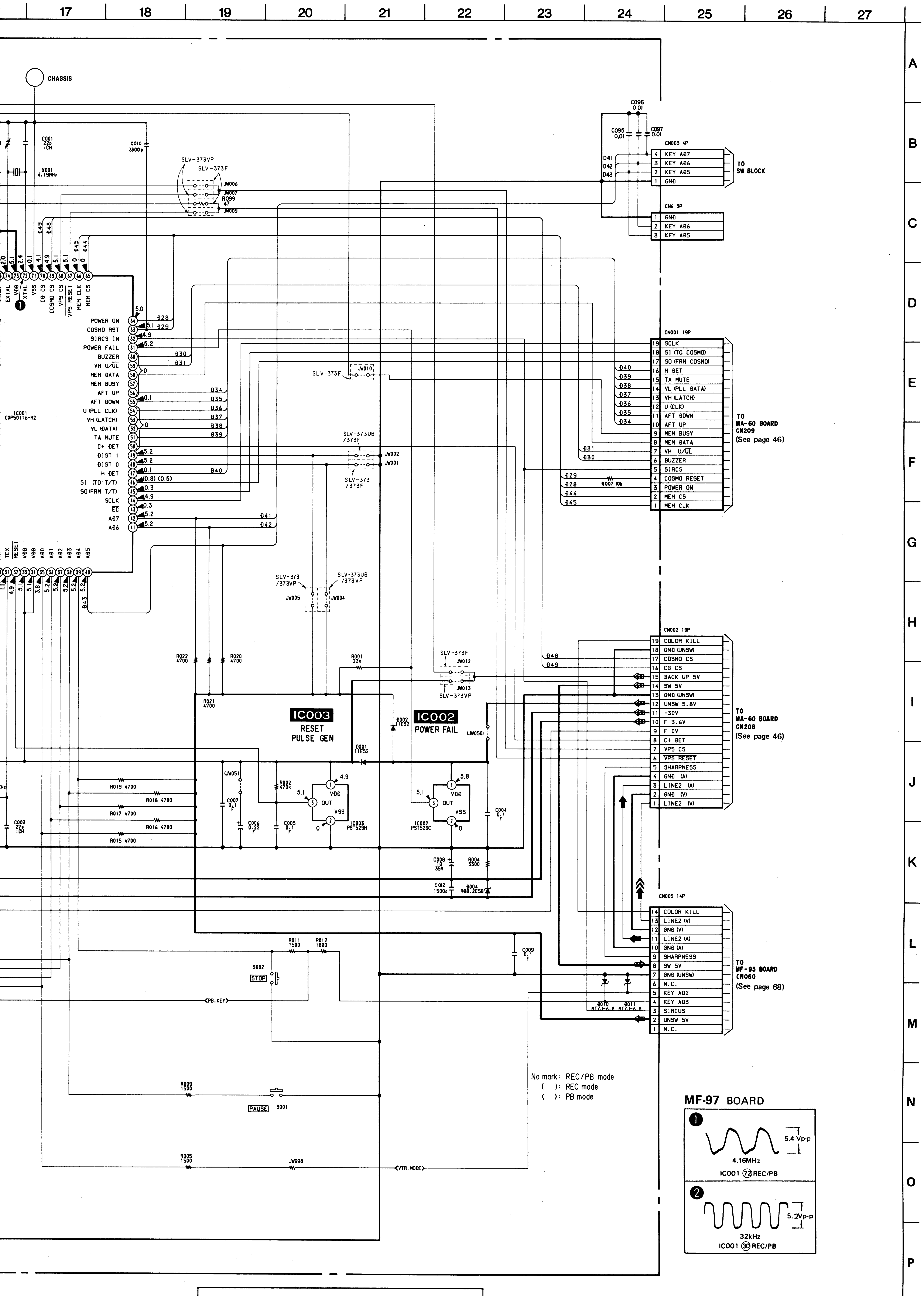
	VIDEO SIGNAL
	Y/CHROMA
REC	➡»

MF-97 BOARD


CHASSIS
CV001 20p
C001 22p :CH
X001 4.19MHz
C010 3300p
C099 0.01
SLV-373VP
SLV-373F
JW006
JW007
R099 47
JW009
FL001
F1
F1
T9
T8
T7
T6
T5
T4
T3
T2
T1
T0
S0
S1
S2
S3
S4
S5
S6
S7
S8
S9
S10
S11
S12
S13
S14
S15
S16
F2
F2
IC001
TIMER/TUNER MODE CONTROL
C+ ON
AV CTRL
TUNER SEL
TV OUT SEL
V FØP
V REF
EXTAL
VDD
XTAL
VSS
CG CS
COSMO CS
VPS CS
VPS RESET
MEM CLK
MEM CS
POWER ON
COSMO RST
SIRCS IN
POWER FAIL
BUZZER
VH U/UL
MEM DATA
MEM BUSY
AFT UP
AFT DOWN
U (PLL CLK)
VH (LATCH)
VL (DATA)
TA MUTE
C+ DET
DIST 1
DIST 0
H DET
SI (TO T/T)
SO (FRM T/T)
SCLK
EC
A07
A06
T3
T2
T1
T0
INT
TX
TEX
RESET
VDD
VSS
A00
A01
A02
A03
A04
A05
IC001 CXP50116-M2
SLV-373F
JW010
SLV-373UB /373F
SLV-373 /373F
SLV-373 /373VP
SLV-373UB /373VP
JW005
JW004
R022 4700
R020 4700
R021 4700
R001 22k
IC003
RESET PULSE GEN
D001 11ES2
JW051
R002 470k
C007 0.1 F
C006 0.22 F
C005 0.1 F
VDD
OUT
VSS
IC003 PST529H
X002 32.768KHz
C002 27p :CH
C003 27p :CH
R019 4700
R018 4700
R017 4700
R016 4700
R015 4700
R011 1500
R012 1800
S002
STOP
(PB.KEY)
CN004 7P
NC
RING0
RING1
RING2
FWD/ RNS
PB KEY
GND (UNSW)
R009 1500
PAUSE
S001
R005 1500
JW998

- ✳ : Impossible to measure the voltage at the marked points.

	VIDEO SIGNAL	AUDIO
	Y/CHROMA	
REC	➡≫	➡

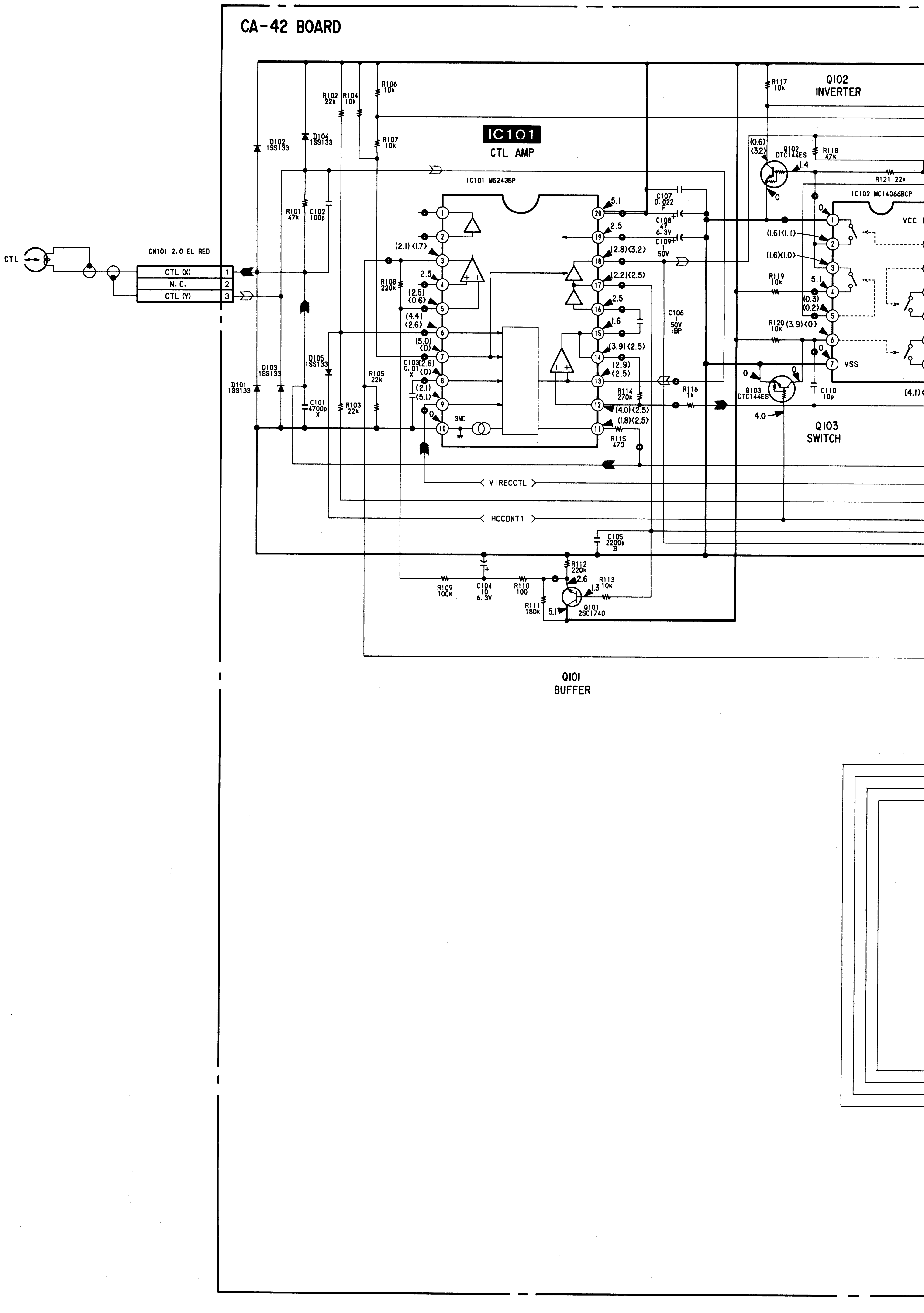

CHASSIS
IC001 CXP50116-M2
POWER ON
COSMO RST
SIRCS IN
POWER FAIL
BUZZER
VH U/UL
MEM DATA
MEM BUSY
AFT UP
AFT DOWN
U (PLL CLK)
VH (LATCH)
VL (DATA)
TA MUTE
C+ DET
DIST 1
DIST 0
H DET
SI (TO T/T)
SO (FRM T/T)
SCLK
EC
A07
A06
EXTAL
VDD
XTAL
VSS
CG CS
COSMO CS
VPS CS
VPS RESET
MEM CLK
MEM CS
X001 4.19MHz
C001 22p :CH
C010 3300p
SLV-373VP
SLV-373F
JW006
JW007
R099 47
JW009
SLV-373F
JW010
SLV-373UB /373F
JW002
JW001
SLV-373 /373F
SLV-373 /373VP
SLV-373UB /373VP
JW005
JW004
R022 4700
R020 4700
R021 4700
R001 22k
SLV-373F
JW012
JW013
SLV-373VP
IC003
RESET PULSE GEN
IC002
POWER FAIL
D002 11ES2
D001 11ES2
(JW050)
(JW051)
R002 470k
C007 0.1 F
C006 0.22 F
C005 0.1 F
IC003 PST529H
IC002 PST529C
C004 0.1 F
C008 10 35V
R004 3300
C012 1500p
D006 RD8.2ESB
R019 4700
R018 4700
R017 4700
R016 4700
R015 4700
C003 27p :CH
R011 1500
R012 1800
C009 0.1 F
S002
STOP
<PB.KEY>
R009 1500
PAUSE
S001
R005 1500
JW998
<VTR.MODE>
C096 0.01
C095 0.01
C097 0.01
CN003 4P
KEY A07
KEY A06
KEY A05
GND
TO SW BLOCK
CN6 3P
GND
KEY A06
KEY A05
CN001 19P
SCLK
SI (TO COSMO)
SO (FRM COSMO)
H DET
TA MUTE
VL (PLL DATA)
VH (LATCH)
U (CLK)
AFT DOWN
AFT UP
MEM BUSY
MEM DATA
VH U/UL
BUZZER
SIRCS
COSMO RESET
POWER ON
MEM CS
MEM CLK
R007 10k
TO MA-60 BOARD CN209 (See page 46)
CN002 19P
COLOR KILL
GND (UNSW)
COSMO CS
CG CS
BACK UP 5V
SW 5V
GND (UNSW)
UNSW 5.8V
-30V
F 3.6V
F 0V
C+ DET
VPS CS
VPS RESET
SHARPNESS
GND (A)
LINE2 (A)
GND (V)
LINE2 (V)
TO MA-60 BOARD CN208 (See page 46)
CN005 14P
COLOR KILL
LINE2 (V)
GND (V)
LINE2 (A)
GND (A)
SHARPNESS
SW 5V
GND (UNSW)
N.C.
KEY A02
KEY A03
SIRCUS
UNSW 5V
N.C.
D010 MTZJ-6.8
D011 MTZJ-6.8
TO MF-95 BOARD CN060 (See page 68)
MF-97 BOARD
5.4 Vp-p
4.16MHz
IC001 (72) REC/PB
5.2Vp-p
32kHz
IC001 (30) REC/PB

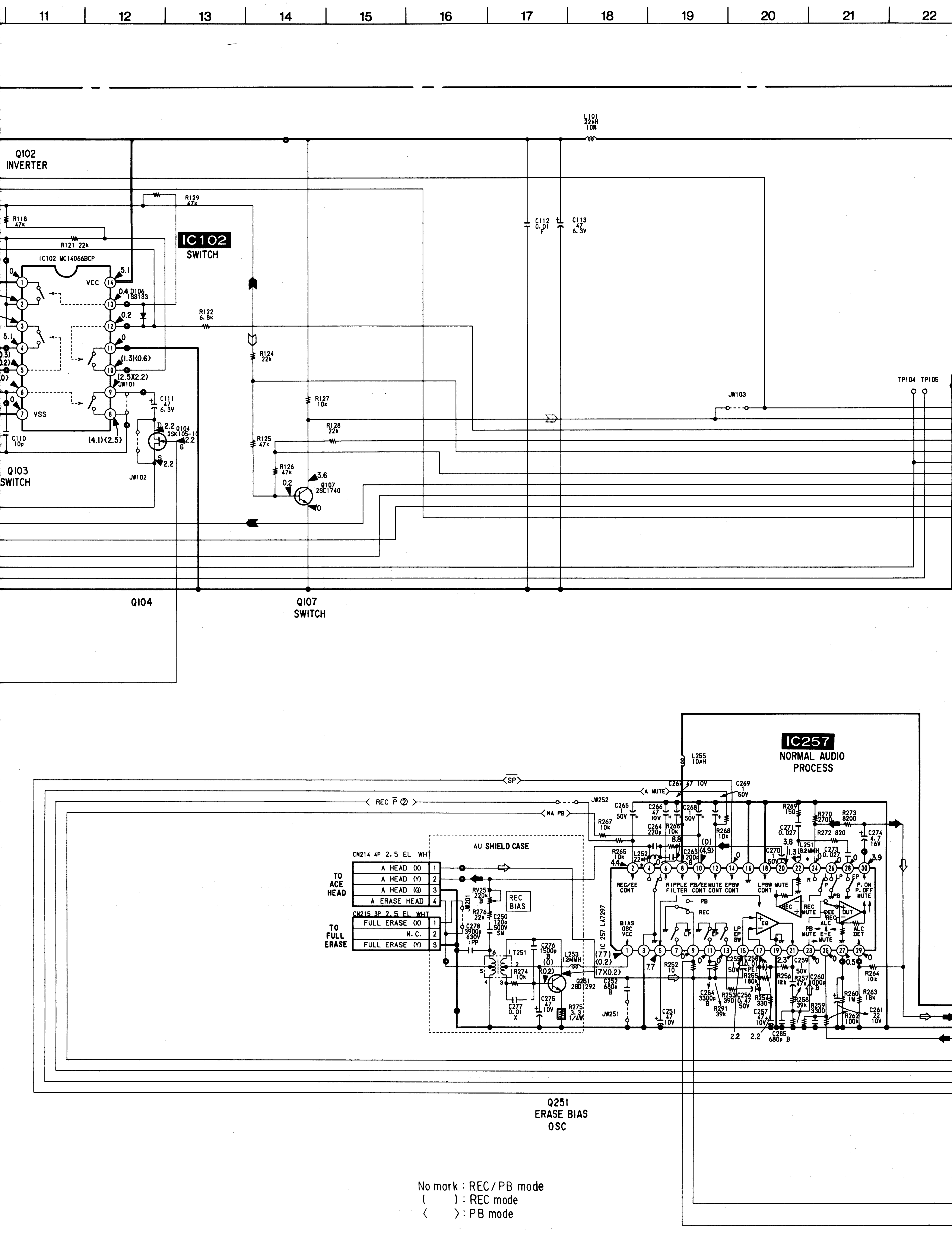
No mark: REC/PB mode
( ): REC mode
( ): PB mode

FUNCTION FUNCTION

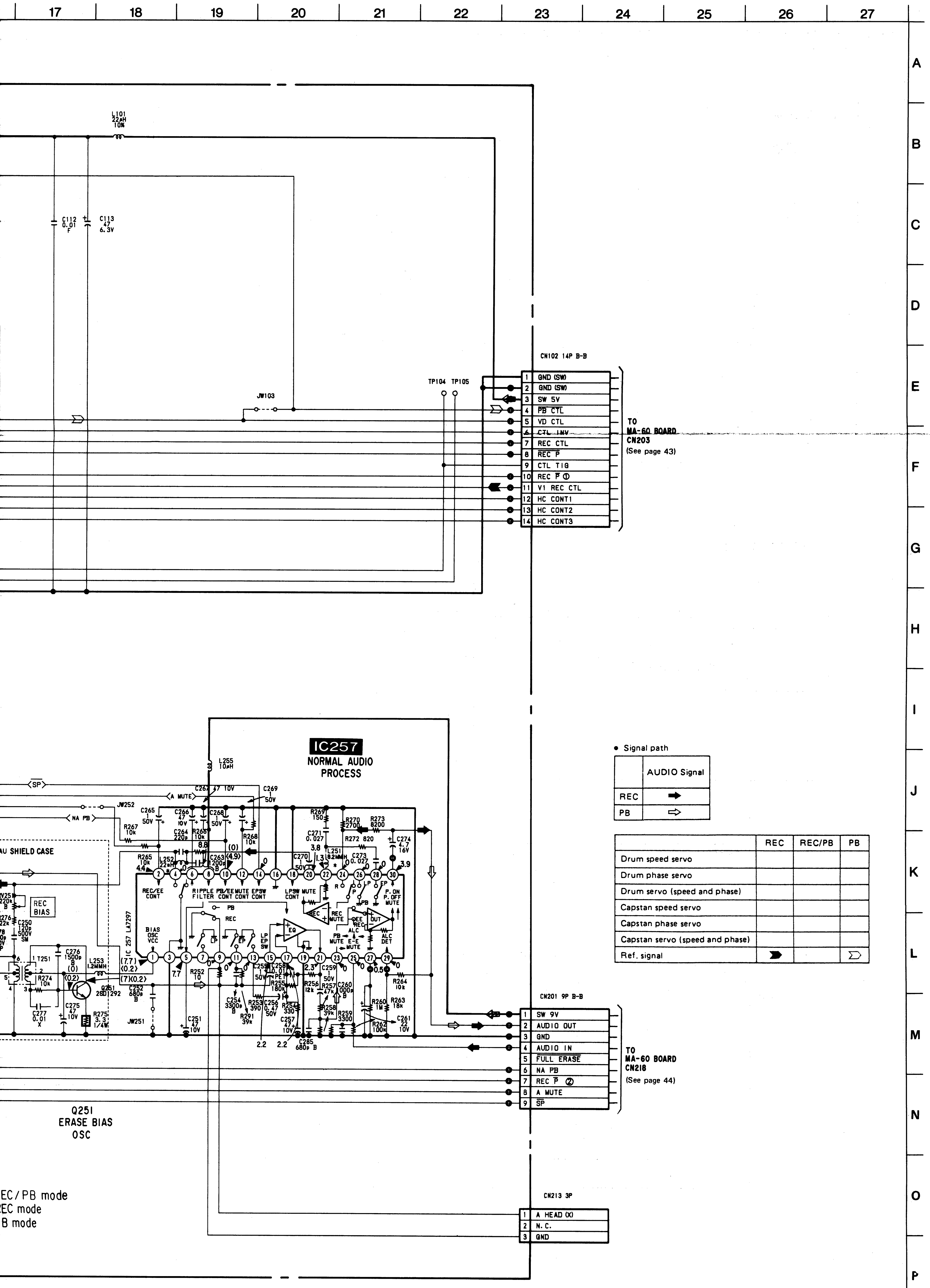
CA-42 (CTL AMP/AUDIO) SCHEMATIC DIAGRAMS

–Ref. No. CA-42 Board: 7,000 series–


CA-42 BOARD
IC101
CTL AMP
IC101 M52435P
CTL
CN101 2.0 EL RED
CTL (X)
N.C.
CTL (Y)
D101 1SS133
D102 1SS133
D103 1SS133
D104 1SS133
D105 1SS133
R101 47k
C102 100p
R102 22k
R104 10k
R106 10k
R107 10k
R108 220k
C101 4700p X
R103 22k
R105 22k
C103 0.01 X
GND
C107 0.022 F
C108 47 6.3V
C109 1 50V
C106 1 50V :BP
R114 270k
R115 470
R116 1k
VIRECCTL
HCCONT1
C105 2200p B
R109 100k
C104 10 6.3V
R110 100
R111 180k
R112 220k
R113 10k
Q101 2SC1740
Q101
BUFFER
R117 10k
Q102
INVERTER
Q102 DTC144ES
R118 47k
R121 22k
IC102 MC14066BCP
VCC
VSS
R119 10k
R120 10k
Q103 DTC144ES
C110 10p
Q103
SWITCH
A B C D E F G H I J K L M N O P
1 2 3 4 5 6 7 8 9 10 11


11
12
13
14
15
16
17
18
19
20
21
22
Q102
INVERTER
IC102
SWITCH
IC102 MC14066BCP
R118 47k
R121 22k
R129 47k
R122 6.8k
R124 22k
R127 10k
R128 22k
R125 47k
R126 47k
Q107 2SC1740
D106 1SS133
C111 47 6.3V
Q104 2SK105-10
JW101
JW102
JW103
C110 10p
VCC
VSS
L101 22μH 10%
C112 0.01 F
C113 47 6.3V
TP104
TP105
Q103
SWITCH
Q104
Q107
SWITCH
IC257
NORMAL AUDIO
PROCESS
L255 10μH
SP
A MUTE
REC P ②
NA PB
JW252
JW251
AU SHIELD CASE
CN214 4P 2.5 EL WHT
A HEAD (X)
A HEAD (Y)
A HEAD (G)
A ERASE HEAD
TO ACE HEAD
CN215 3P 2.5 EL WHT
FULL ERASE (X)
N.C.
FULL ERASE (Y)
TO FULL ERASE
RV251 220k B
REC BIAS
R276 22k
C250 120p 500V SM
C278 3900p 630V PP
T251
C276 1500p B
L253 1.2MMH
R274 10k
C277 0.01 X
C275 47 10V
R275 3.3 1/4W
Q251 2SD1292
C252 680p B
IC257 LA7297
BIAS OSC VCC
REC/EE CONT
RIPPLE FILTER
PB/EE CONT
MUTE CONT
EPSW CONT
LPSW CONT
MUTE
LP
EP
EQ
REC MUTE
PB MUTE
E-E
ALC
ALC DET
OUT
P.ON P.OFF MUTE
C251 47 10V
R252 10
C254 3300p B
R253 390
C256 0.47 50V
R291 39k
C257 47 10V
C285 680p B
R255 180k
R254 330
R256 12k
R257 47k
R258 39k
R259 3300
C259 1 50V
C260 1000p B
R260 1M
R262 100k
R263 18k
R264 10k
C261 22 10V
C265 1 50V
C266 47 10V
C264 220p
R266 10k
R267 10k
R265 10k
L252 22μH
C263 1200p B
C268 1 50V
R268 10k
C262 47 10V
C269 1 50V
C270 1 50V
C271 0.027
L251 8.2MMH
C273 0.027
R269 150
R270 2700
R273 8200
R272 820
C274 4.7 16V
Q251
ERASE BIAS
OSC

No mark : REC/PB mode
( ) : REC mode
〈 〉: PB mode


17
18
19
20
21
22
23
24
25
26
27
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
L101 22μH 10%
C112 0.01 F
C113 47 6.3V
JW103
TP104
TP105
CN102 14P B-B
1 GND (SW)
2 GND (SW)
3 SW 5V
4 PB CTL
5 VD CTL
6 CTL INV
7 REC CTL
8 REC P
9 CTL TIG
10 REC P ①
11 V1 REC CTL
12 HC CONT1
13 HC CONT2
14 HC CONT3
TO MA-60 BOARD CN203
(See page 43)
IC257
NORMAL AUDIO PROCESS
IC 257 LA7297
L255 10μH
SP
A MUTE
NA PB
JW252
JW251
AU SHIELD CASE
REC BIAS
REC/EE CONT
RIPPLE FILTER
PB/EE CONT
MUTE CONT
EPSW CONT
LPSW CONT
MUTE
BIAS OSC VCC
LP EP SW
EQ
REC MUTE
PB MUTE
E-E
ALC
ALC DET
P.ON P.OFF MUTE
OUT
T251
L253 1.2MMH
Q251 2SD1292
C276 1500p
C275 47 10V
R275 3.3 1/4W
C277 0.01
R274 10k
C250 120p 500V
C252 680p
C251 47 10V
R252 10
R267 10k
R265 10k
C265 1 50V
C266 47 10V
C264 220p
R266 10k
C268 1 50V
R268 10k
C263 200p
C267 47 10V
C269 1 50V
R269 150
R270 2700
R273 8200
R272 820
C271 0.027
L251 82MMH
C273 0.027
C274 4.7 16V
C270 1 50V
C254 3300p
R253 390
C256 0.47 50V
R254 330
R255 180k
R256 12k
R257 47k
R258 39k
R259 3300
C257 47 10V
C258
C259 1 50V
C260 1000p
R260 1M
R262 100k
R263 18k
R264 10k
C261 22 10V
C285 680p
R291 39k
CN201 9P B-B
1 SW 9V
2 AUDIO OUT
3 GND
4 AUDIO IN
5 FULL ERASE
6 NA PB
7 REC P ②
8 A MUTE
9 SP
TO MA-60 BOARD CN218
(See page 44)
CN213 3P
1 A HEAD (X)
2 N.C.
3 GND
Q251
ERASE BIAS
OSC

EC/PB mode
EC mode
B mode

- Signal path

	AUDIO Signal
REC	➡
PB	⇨

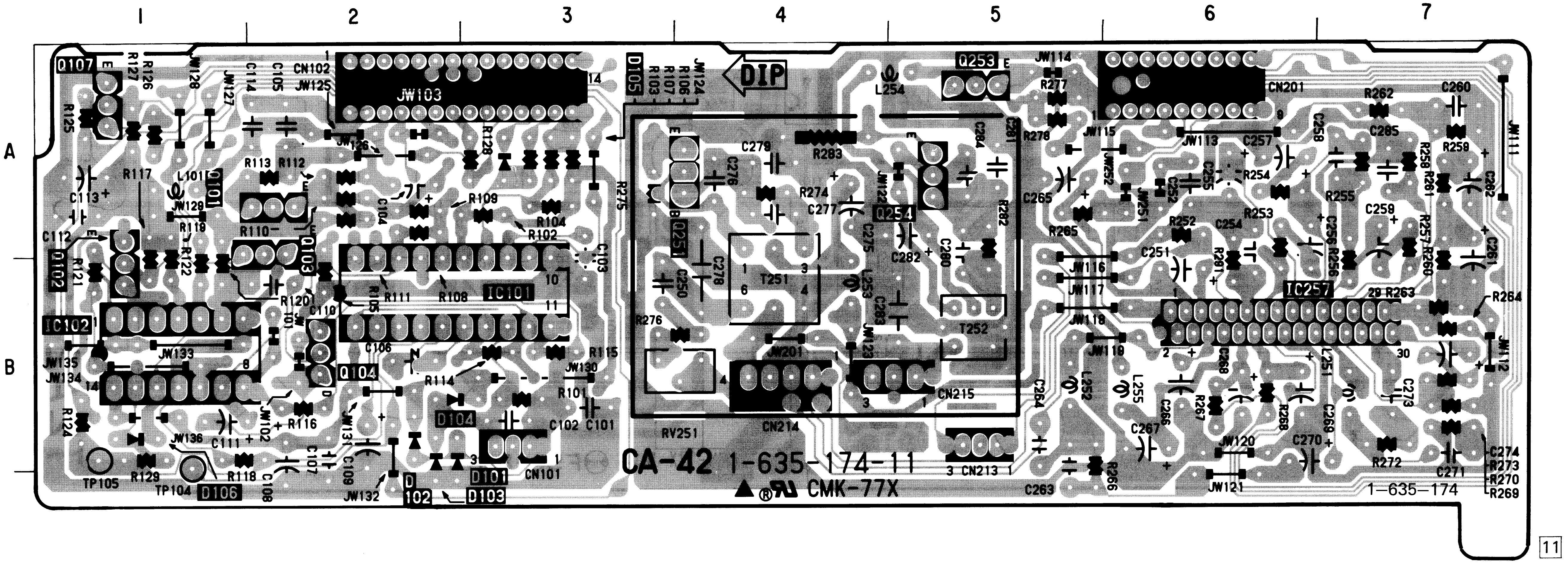
	REC	REC/PB	PB
Drum speed servo			
Drum phase servo			
Drum servo (speed and phase)			
Capstan speed servo			
Capstan phase servo			
Capstan servo (speed and phase)			
Ref. signal	➤		▷

CTL AMP/AUDIO CTL AMP/AUDIO

CA-42 (CTL AMP/AUDIO) PRINTED WIRING BOARD

–Ref. No. CA-42 Board: 7,000 series–

CA-42 BOARD


1
2
3
4
5
6
7
A
B
Q107
R127
R126
JW128
JW127
C114
C105
CN102
JW125
JW103
D105
R103
R107
R106
JW124
DIP
L254
Q253
JW114
R277
CN201
R262
C260
JW111
R125
R278
JW115
JW113
C257
C258
C285
R258
R259
C262
R117
C113
L101
D101
R113
R112
C104
R109
R104
R102
R275
C279
R283
C276
R274
C277
JW122
Q254
C284
C281
R282
C265
JW252
C252
C255
R254
C261
JW129
R119
R110
R265
R255
C259
R257
R260
C112
D102
R121
R122
Q103
R111
R108
IC101
C103
Q251
C278
C250
T251
C275
L253
C282
C280
C283
T252
JW116
JW117
JW118
JW119
C251
R252
C254
R253
R281
C256
R256
IC257
R263
R264
IC102
R120
C110
JW133
JW135
JW134
C106
Q104
R114
R115
JW130
R101
R276
JW201
JW123
CN215
C264
L252
L255
C266
R267
C268
R268
C269
L251
C273
JW112
R124
JW136
C111
JW102
R116
JW131
C107
C109
D104
C102
C101
RV251
CN214
C267
JW120
C270
R272
C274
R273
R270
R269
C271
TP105
R129
TP104
D106
R118
C108
JW132
D102
D101
D103
CN101
CA-42 1-635-174-11
CMK-77X
CN213
C263
R266
JW121
1-635-174
11

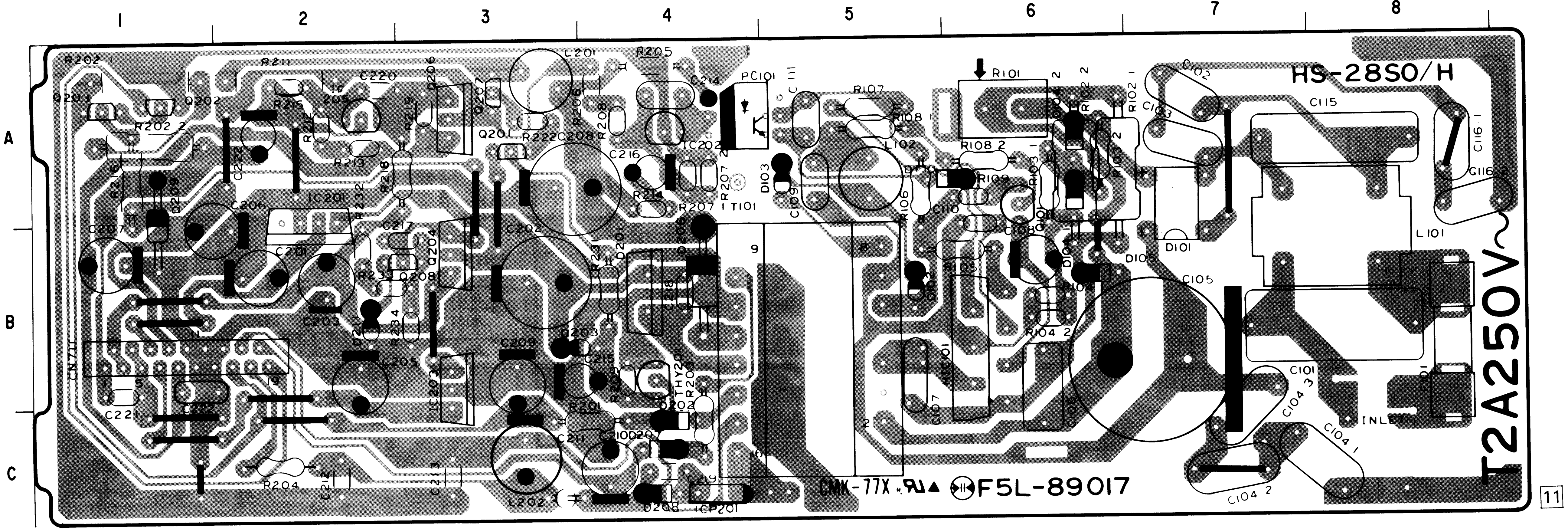
CA-42 BOARD

D101	B-2
D102	B-2
D103	B-2
D104	B-3
D105	A-3
D106	B-1
IC101	B-2
IC102	B-1
IC257	B-6
Q101	A-2
Q102	B-1
Q103	B-2
Q104	B-2
Q107	A-1
Q251	A-4

POWER SUPPLY PRINTED WIRING BOARD

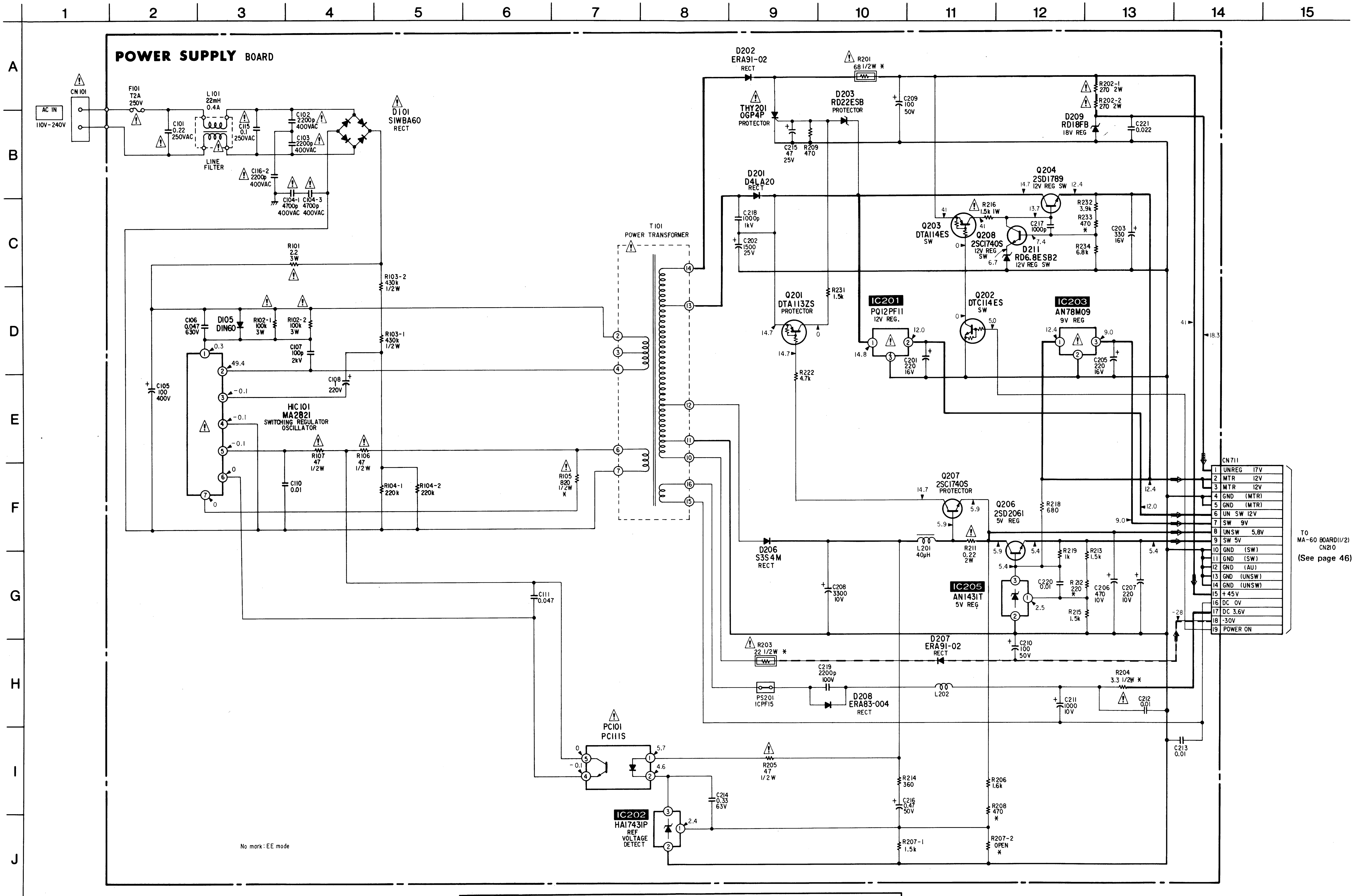
–Ref. No. 9,000 series–

POWER BOARD


1
2
3
4
5
6
7
8
A
B
C
R202 1
R211
Q201
Q202
R202 2
R215
R212
C220
Q206
Q207
R219
L201
R205
C214
PC101
C111
R107
R101
R108 1
R102 2
R102 1
C102
C103
HS-28SO/H
C115
C116 1
C116 2
Q201
R222
C208
R206
R208
IC202
L102
R108 2
R103 2
R103 1
D104 2
R213
R218
C216
R207 2
D103
C109
D110
R109
R216
D209
C222
IC201
R232
R214
R207 1
T101
R106
C110
Q101
D101
L101
C207
C206
C217
C202
C201
R233
Q208
Q204
R231
D201
D206
9
8
C108
R105
D102
D104
D105
C105
C203
R234
C218
R104 1
R104 2
CN711
5
19
D211
C205
C209
D203
C215
IC203
THY201
R203
R209
R201
D204
C101
C104 3
C104 1
C104 2
INLET
F101
T2A250V~
C221
C222
C211
C210
D207
IC101
C107
C106
2
R204
C212
C213
L202
D208
C219
ICP201
CMK-77X
F5L-89017
11

POWER SUPPLY SCHEMATIC DIAGRAM

– Ref. No. 9,000 series–


1
2
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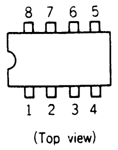
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
POWER SUPPLY BOARD
AC IN
110V-240V
CN101
F101
T2A
250V
C101
0.22
250VAC
L101
22mH
0.4A
LINE FILTER
C115
0.1
250VAC
C102
2200p
400VAC
C103
2200p
400VAC
C116-2
2200p
400VAC
C104-1
4700p
400VAC
C104-3
4700p
400VAC
D101
S1WBA60
RECT
R101
2.2
3W
R103-2
430k
1/2W
R103-1
430k
1/2W
C106
0.047
630V
D105
DIN60
R102-1
100k
3W
R102-2
100k
3W
C107
100p
2kV
C108
220V
C105
100
400V
HIC101
MA2821
SWITCHING REGULATOR OSCILLATOR
0.3
49.4
-0.1
-0.1
-0.1
0
0
C110
0.01
R107
47
1/2W
R106
47
1/2W
R104-1
220k
R104-2
220k
R105
820
1/2W
T101
POWER TRANSFORMER
C111
0.047
PC101
PC111S
0
-0.1
5.7
4.6
IC202
HA17431P
REF VOLTAGE DETECT
2.4
C214
0.33
63V
R205
47
1/2W
No mark : EE mode
D202
ERA91-02
RECT
R201
68 1/2W
THY201
OGP4P
PROTECTOR
D203
RD22ESB
PROTECTOR
C215
47
25V
R209
470
C209
100
50V
R202-1
270 2W
R202-2
270 2W
D209
RD18FB
18V REG
C221
0.022
D201
D4LA20
RECT
C218
1000p
1kV
C202
1500
25V
Q204
2SD1789
12V REG SW
14.7
12.4
R216
1.5k 1W
Q203
DTA114ES
SW
41
41
13.7
C217
1000p
7.4
Q208
2SC1740S
12V REG SW
6.7
D211
RD6.8ESB2
12V REG SW
R232
3.9k
R233
470
R234
6.8k
C203
330
16V
Q201
DTA113ZS
PROTECTOR
R231
1.5k
14.7
14.7
R222
4.7k
IC201
PQ12PF11
12V REG.
14.8
12.0
C201
220
16V
Q202
DTC114ES
SW
5.0
IC203
AN78M09
9V REG
12.4
9.0
C205
220
16V
41
18.3
Q207
2SC1740S
PROTECTOR
14.7
5.9
5.9
Q206
2SD2061
5V REG
R218
680
12.4
12.0
9.0
D206
S3S4M
RECT
L201
40μH
R211
0.22
2W
5.9
5.4
5.4
5.4
R219
1k
R213
1.5k
C208
3300
10V
IC205
AN1431T
5V REG
2.5
C220
0.01
R212
220
C206
470
10V
C207
220
10V
R215
1.5k
-28
R203
22 1/2W
D207
ERA91-02
RECT
C210
100
50V
C219
2200p
100V
PS201
ICPF15
D208
ERA83-004
RECT
L202
R204
3.3 1/2W
C211
1000
10V
C212
0.01
C213
0.01
R214
360
C216
0.47
50V
R207-1
1.5k
R206
1.6k
R208
470
R207-2
OPEN
CN711
1 UNREG 17V
2 MTR 12V
3 MTR 12V
4 GND (MTR)
5 GND (MTR)
6 UN SW 12V
7 SW 9V
8 UNSW 5.8V
9 SW 5V
10 GND (SW)
11 GND (SW)
12 GND (AU)
13 GND (UNSW)
14 GND (UNSW)
15 +45V
16 DC 0V
17 DC 3.6V
18 -30V
19 POWER ON
TO MA-60 BOARD(1/2) CN210
(See page 46)

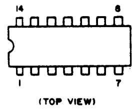
POWER SUPPLY POWER SUPPLY

4-3. SEMICONDUCTOR LEAD LAYOUTS

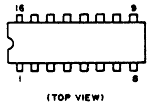
BA4560
CXL5003P
LM393N
MSM6989RS
ST93C46AB1


8 7 6 5
1 2 3 4
(Top view)

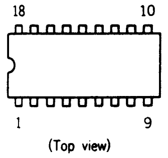
BA10324
LM324N
MC14066BCP
SDA5642


14
8
1
7
(TOP VIEW)

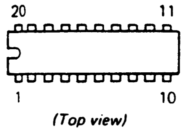
TC4052BPHB


16
9
1
8
(TOP VIEW)

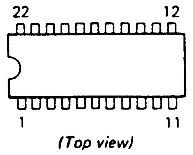
AN3814K


18
10
1
9
(Top view)

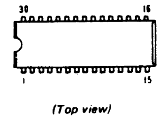
M52435P


20
11
1
10
(Top view)

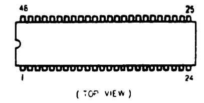
AN3592K


22
12
1
11
(Top view)

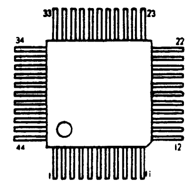
HA118016NT
HA118019NT
LC6543H-4374


30
16
1
15
(Top view)

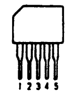
AN3231K


48
25
1
24
(TOP VIEW)

UPD75004GB-VSX182


33
23
34
22
44
12

LA7213



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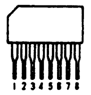

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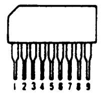

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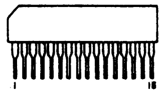
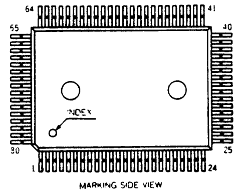
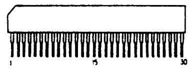


CXP50116-VSX350


64
41
65
40
80
25
1
24
INDEX
MARKING SIDE VIEW

LA7297



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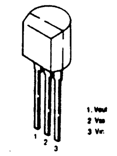
PST529H



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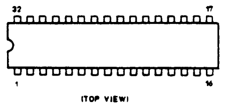
32
17
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16
(TOP VIEW)

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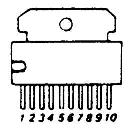
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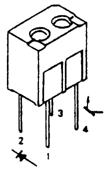

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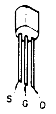

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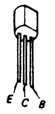

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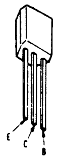
DTA144ES
DTC114ES
DTC144ES
2SC1740S-QR
2SD1292



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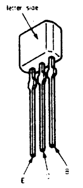

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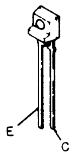

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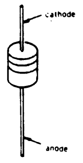
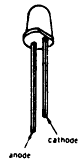
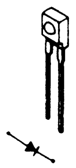
RD6.8ES-B2
RD8.2ES-B2
RD13ES-B2
RD33ES-B2
1SR139-100
1SS119


cathode
anode

SLR-34MC3


cathode
anode

GL451V



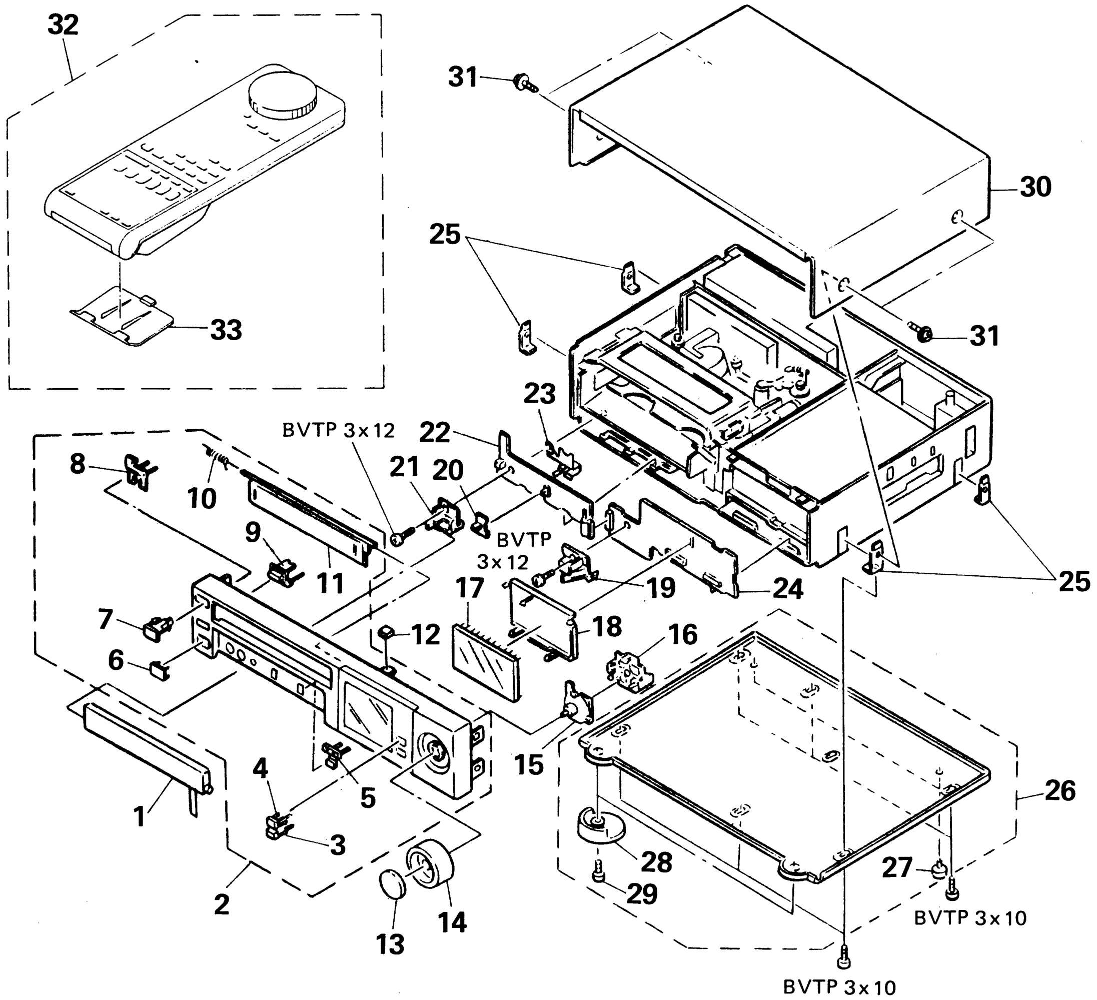
SECTION 5
EXPLODED VIEWS

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part number suffix -XX and -X may be different from the parts specified in the components used on the set.
- Color Indication of Appearance Parts Example:
  (RED) . . . KNOB, BALANCE (WHITE)
  ↑ ↑
  Cabinet's Color Parts Color

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

5-1. FRONT PANEL, CABINET ASSEMBLIES


32
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30
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25
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BVTP 3x12
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21 20
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BVTP 3x12
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24
25
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12
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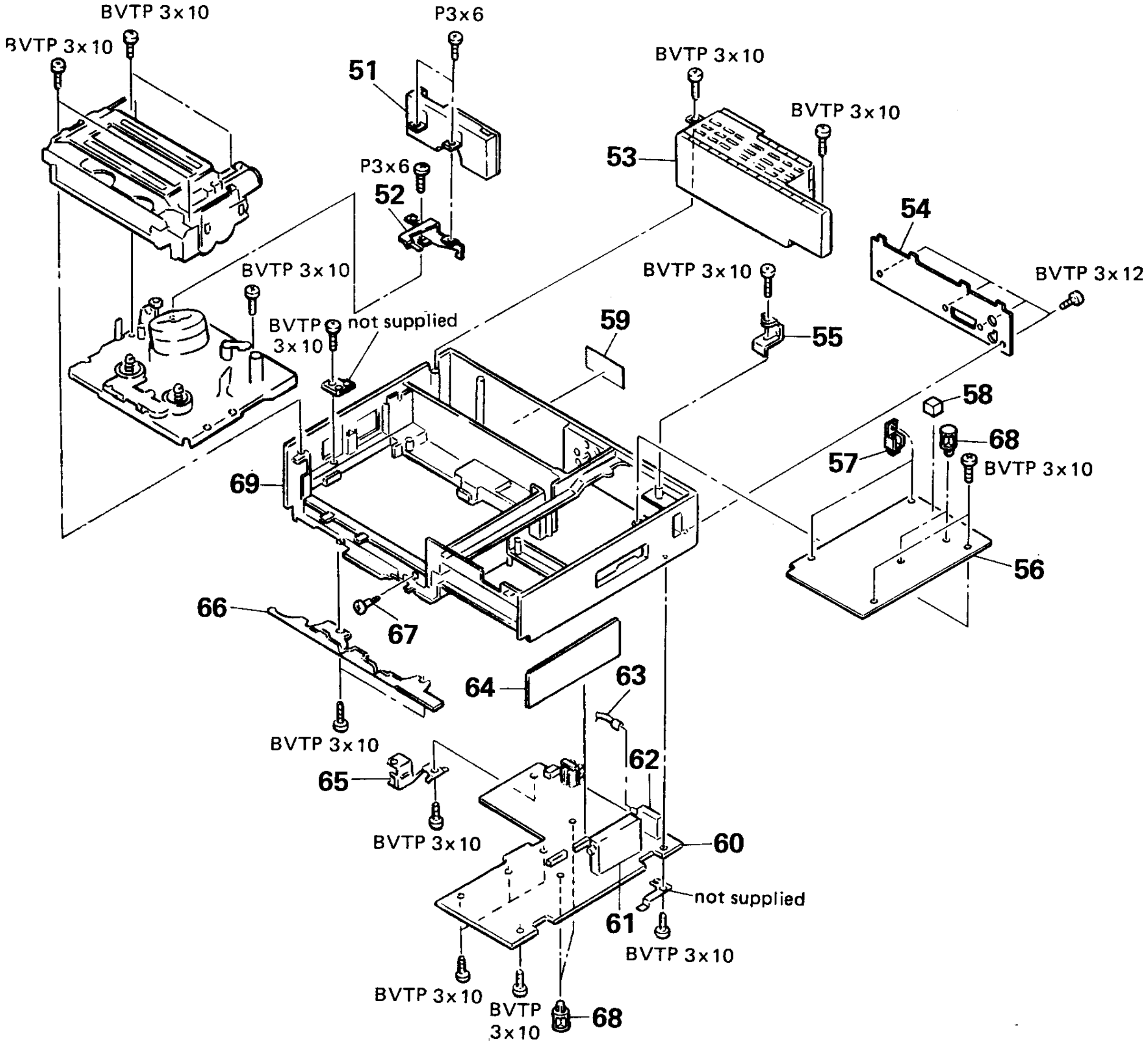
4
5
26
1
3
28
29
27
BVTP 3x10
2
14
13
BVTP 3x10

No.	Part No.	Description	Remark
1	1-466-315-11	SWITCH BLOCK, CONTROL (SLV-373UB)	
	1-466-315-21	SWITCH BLOCK, CONTROL (SLV-373)	
	1-466-315-31	SWITCH BLOCK, CONTROL (SLV-373VP)	
2	X-3746-001-1	PANEL ASSY, FRONT (SLV-373VP)	3-11
	X-3746-002-1	PANEL ASSY, FRONT (SLV-373/373UB)	3-11
3	3-741-971-21	BUTTON, STOP (■)	
4	3-741-978-21	BUTTON, STOP (ıı/▶◀)	
5	3-746-010-01	BUTTON, VPS (SLV-373VP)	
6	3-741-981-31	WINDOW, LAY CATCHER BLOCK	
7	3-741-973-01	BUTTON, POWER (ON/STANDBY)	
8	3-741-975-01	TIP, POWER BUTTON	
9	3-741-974-01	BUTTON, EJECT (⏏ EJECT)	
10	3-741-977-01	SPRING (FL), TORSION	
11	3-746-028-01	DOOR (E), CASSETTE	
12	9-911-841-XX	CUSHION (B)	
13	3-741-951-21	BUTTON, PLAY (▷ PLAY)	
14	3-741-952-01	RING, SHUTTLE	
15	*1-635-173-11	MF-96 BOARD	
16	*3-741-965-01	HOLDER, PC BOARD	
17	1-519-580-11	INDICATOR TUBE, FLUORESCENT	
18	*3-744-220-01	HOLDER, FL	
19	3-741-967-01	PLATE (RIGHT), FULCRUM, DOOR	
20	3-744-217-01	KNOB, SELECTION (COMMAND MODE)	
21	3-741-966-01	PLATE (LEFT), FULCRUM, DOOR	
22	*A-6754-047-A	MF-95 BOARD, COMPLETE (SLV-373UB)	
22	*A-6754-052-A	MF-95 BOARD, COMPLETE (SLV-373VP)	
	*A-6754-053-A	MF-95 BOARD, COMPLETE (SLV-373)	
23	3-741-968-01	PLATE, GROUND, MF	
24	*A-6721-328-A	MF-97 BOARD, COMPLETE (SLV-373UB)	
	*A-6721-330-A	MF-97 BOARD, COMPLETE (SLV-373VP)	
24	*A-6721-331-A	MF-97 BOARD, COMPLETE (SLV-373)	
25	*3-741-992-01	STOPPER, UPPER CASE	
26	X-3733-346-2	PLATE ASSY, BOTTOM	27-29
27	3-670-155-11	LEG	
28	X-3733-345-1	INSULATOR ASSY	
29	3-721-343-01	SCREW, FIXED, M4X7	
30	3-746-051-01	CASE, UPPER	
31	3-710-901-11	SCREW (3X8), TAPPING	
32	1-465-514-11	REMOTE COMMANDER ASSY (RMT-V373)	33
33	3-746-029-01	COVER, BATTERY	

5-2. CHASSIS ASSEMBLY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P3x6
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BVTP 3x10
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BVTP 3x10
54
BVTP 3x12
BVTP 3x10
BVTP 3x10
not supplied
59
BVTP 3x10
55
58
68
57
BVTP 3x10
69
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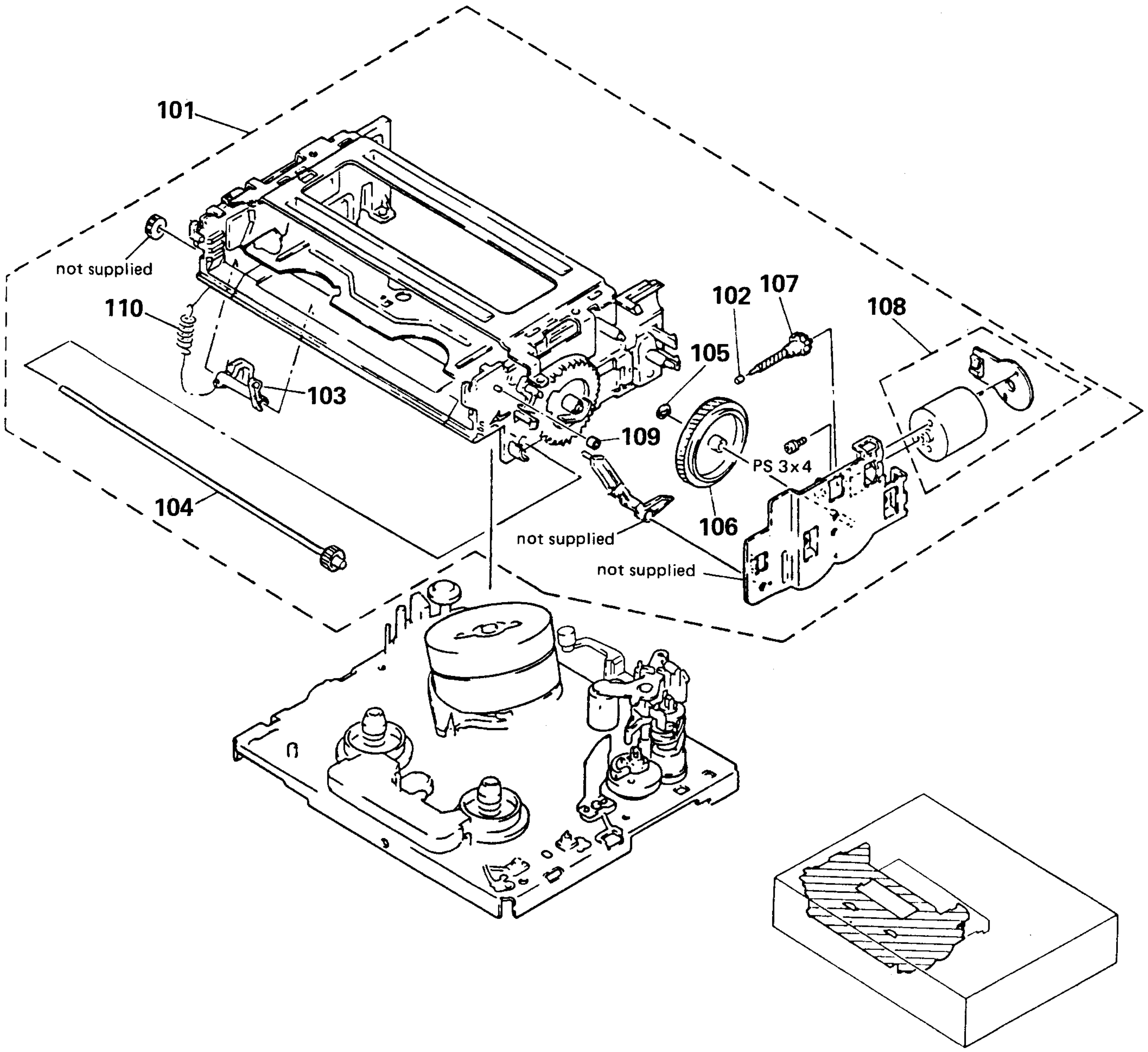
66
67
64
63
BVTP 3x10
62
65
BVTP 3x10
60
not supplied
61
BVTP 3x10
BVTP 3x10
BVTP 3x10
68

No.	Part No.	Description	Remark
51	*A-6727-189-A	RP-100 BOARD, COMPLETE	
52	X-3746-004-1	GROUND ASSY, SHAFT	
53	⚠1-413-535-11	BLOCK, POWER (SLV-373UB)	
	⚠1-413-537-11	BLOCK, POWER (SLV-373VP)	
	⚠1-413-538-11	BLOCK, POWER (SLV-373)	
54	3-746-011-01	PLATE, ORNAMENTAL, JACK	
55	*3-741-963-01	BRACKET, RF	
56	*A-6727-187-A	YC-90 BOARD, COMPLETE	
57	3-736-704-01	HINGE, PC BOARD	
58	9-911-843-XX	CUSHION	
59	*3-746-001-01	LABEL, MODEL NUMBER (NO.2) (SLV-373UB)	
	*3-746-002-01	LABEL, MODEL NUMBER (NO.2) (SLV-373)	
	*3-746-003-01	LABEL, MODEL NUMBER (NO.2) (SLV-373VP)	
60	*A-6725-799-A	MA-60 BOARD, COMPLETE (SLV-373UB)	
	*A-6725-801-A	MA-60 BOARD, COMPLETE (SLV-373VP)	
	*A-6725-802-A	MA-60 BOARD, COMPLETE (SLV-373)	
61	1-465-260-11	TUNER, ET (BTP-2C401) (SLV-373/373VP)	
	1-465-262-11	TUNER, ET (SLV-373UB)	
62	⚠1-466-328-11	MODULATOR, RF (RFU-2017) (SLV-373/373VP)	
	⚠1-466-347-11	MODULATOR, RF (RFU-2024) (SLV-373UB)	
63	1-558-924-41	CABLE, PIN	
64	*A-6713-386-A	CA-42 BOARD, COMPLETE	
65	*3-741-962-01	PLATE, GROUND, JMP	
66	3-741-953-03	ESCUTCHEON, FRAME	
67	3-741-948-11	SCREW (3), SPECIAL (+) TAPPING	
68	3-682-057-11	SPACER (SMALL)	
69	*3-741-990-01	FRAME, MOLD	

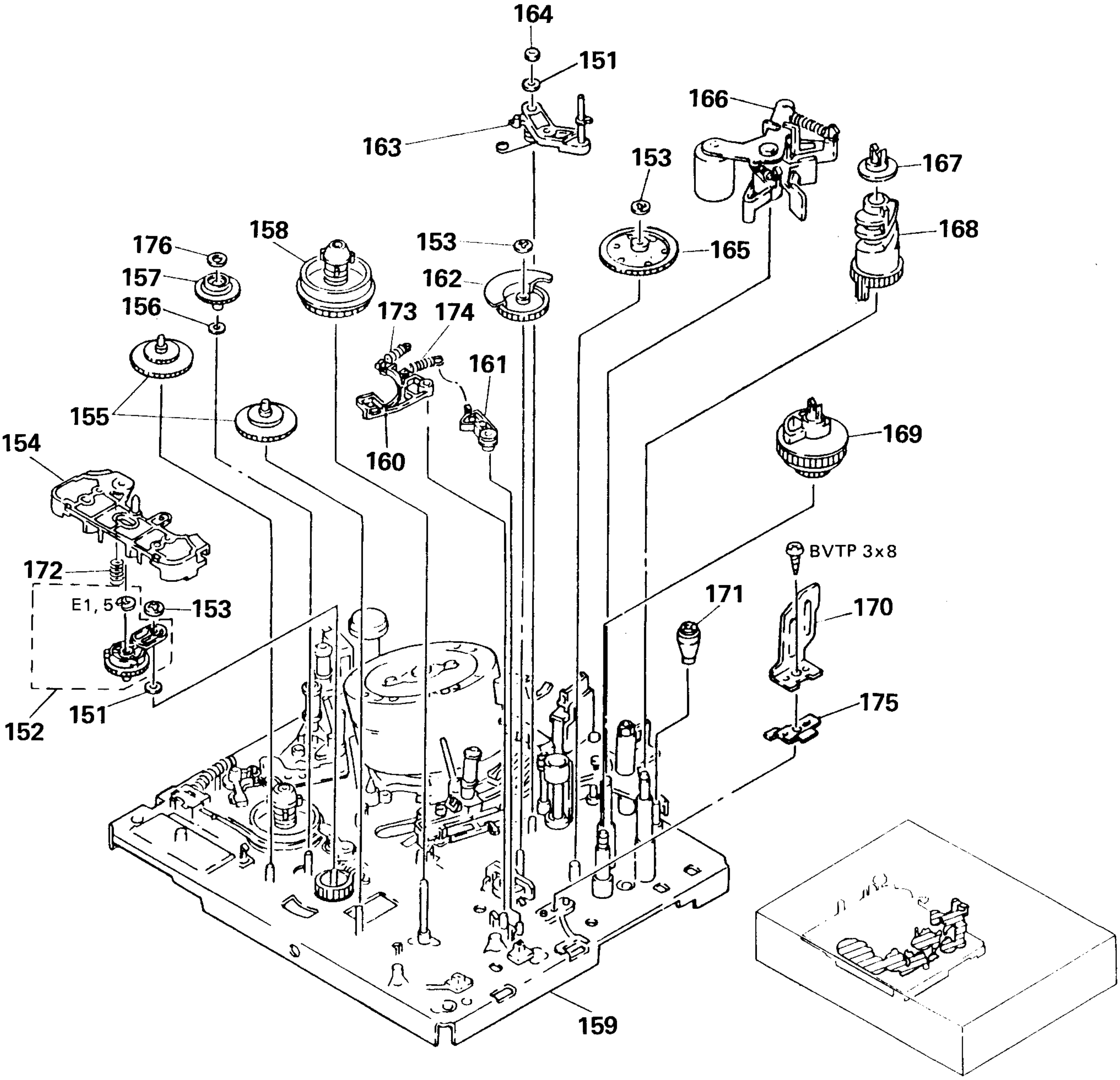
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

5-3. FL CASSETTE COMPARTMENT


101
not supplied
110
103
104
102
107
108
105
109
PS 3x4
106
not supplied
not supplied

No.	Part No.	Description	Remark
101	A-6751-421-A	FL BLOCK ASSY (M2)	102-110
102	3-716-144-02	RETAINER, WORM	
103	3-736-163-01	LEVER, ERASING PROTECTION	
104	X-3727-775-2	GEAR (RIGHT) ASSY, MIDWAY	
105	3-696-510-01	WASHER (3), STOPPER	
106	3-736-164-01	WHEEL (FL), WORM	
107	3-736-100-01	GEAR (FL), WORM	
108	X-3727-784-1	MOTOR ASSY (LOADING) (M904)	
109	3-696-388-01	RUBBER, JOINT	
110	3-739-687-01	SPRING, TENSION	

5-4. MECHANISM DECK 1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173
174
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169
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160
BVTP 3x8
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E1, 5
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175
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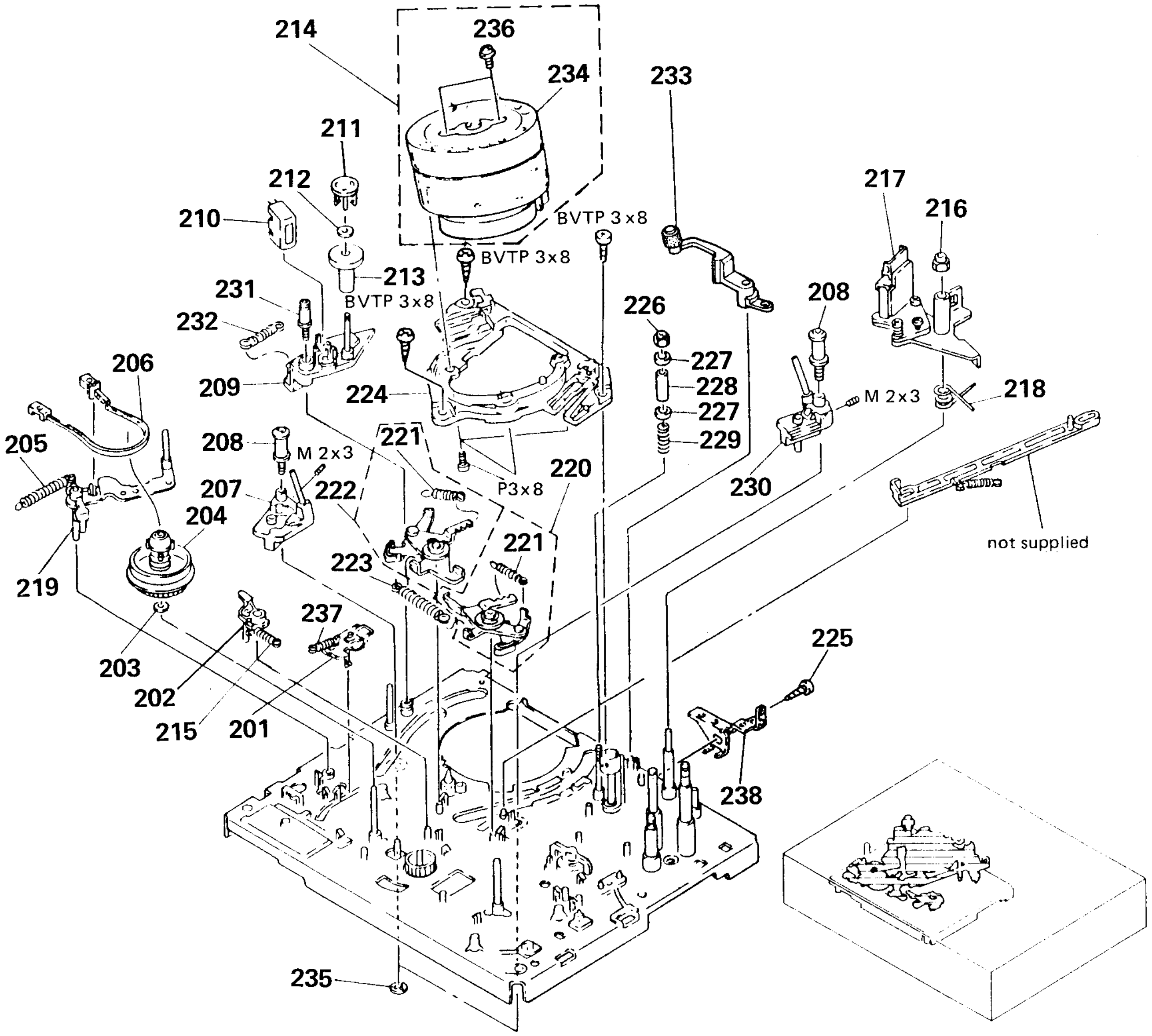
159

No.	Part No.	Description	Remark
151	3-701-438-11	WASHER, 2.5	
152	X-3727-776-1	ARM ASSY, PENDULUM	
153	3-669-595-00	WASHER (2), STOPPER	
154	3-736-172-02	RELEASE, LOCK, REEL	
155	X-3727-795-1	GEAR ASSY, RELAY	
156	3-736-074-01	RETAINER (SMALL), THRUST	
157	3-736-037-01	GEAR, REW	
158	X-3727-798-1	TABLE ASSY, REEL	
159	*A-6773-084-A	MD BLOCK ASSY 151-157,160-172,175,176 201-203,205-208,216,218,219,226-230 235,237,251-260,262,267-277,280-285 287-289,291,292,297	
160	X-3733-335-1	BRAKE ASSY (AT), T SOFT	
161	3-736-105-01	ARM, REV BRAKE	
162	3-736-143-01	GEAR, RVS CAM	
163	X-3729-911-1	ARM ASSY, RVS	
164	3-736-740-01	NUT (M2X0.25), NYLON	
165	3-736-116-01	GEAR, COMMUNICATION	
166	X-3727-770-1	PINCH ROLLER BLOCK ASSY	
167	3-736-111-01	STOPPER	
168	3-736-136-01	CAM, ELEVATOR	
169	3-736-135-01	GEAR, PRESS CAM	
170	3-736-109-01	PLATE, OPEN, LID	
171	3-738-250-01	SCREW, AC ADJUSTMENT	
172	3-736-020-11	SPRING, COMPRESSION	
173	3-736-024-01	SPRING, TENSION	
174	3-736-025-01	SPRING (REV BRAKE), TENSION	
175	3-744-227-01	SPRING (ATOM), FL GROUND	
176	3-736-069-01	RETAINER, SPRING	

5-5. MECHANISM DECK 2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BVTP 3x8
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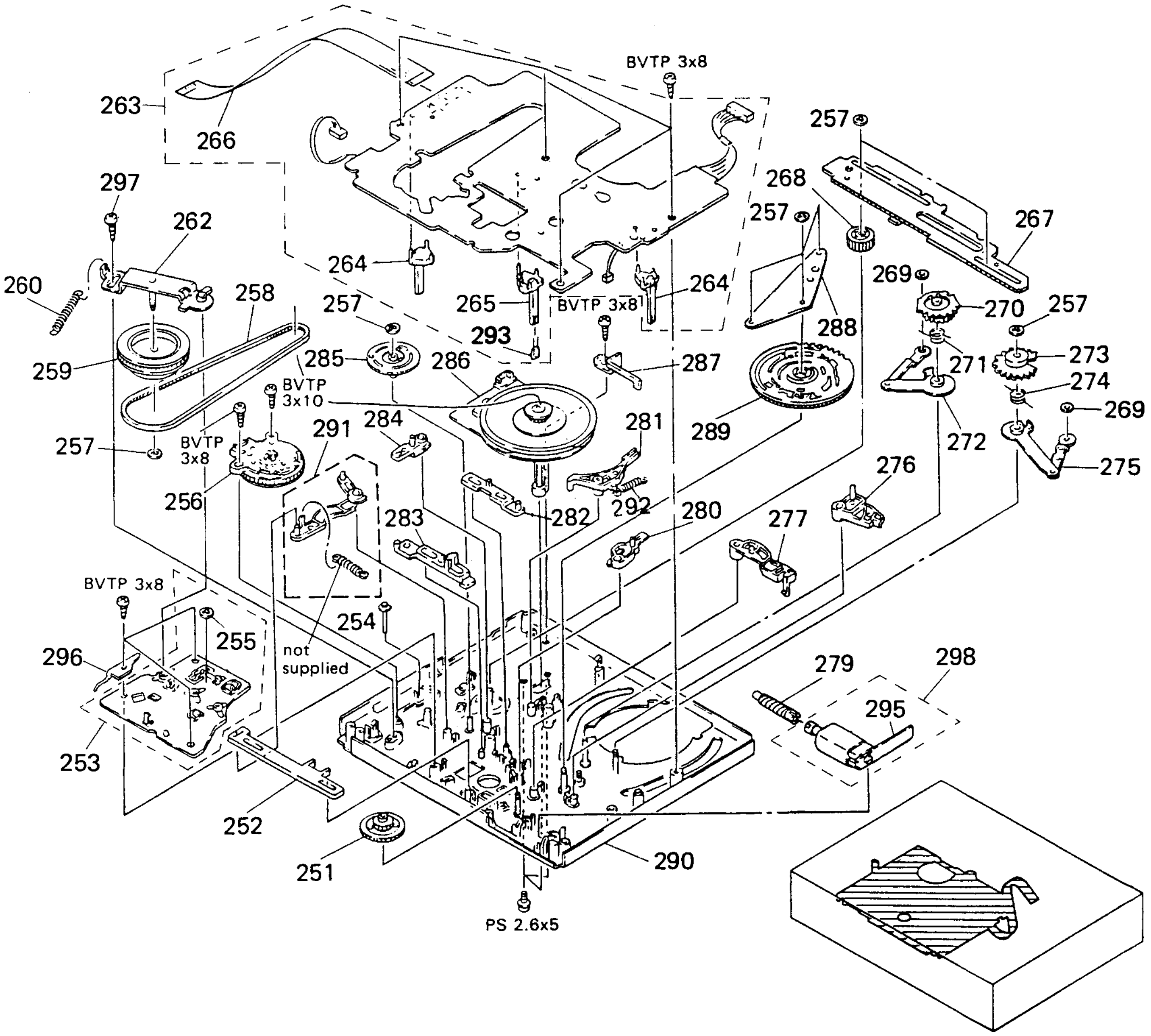
227
206
209
224
228
227
M 2x3
218
205
208
M 2x3
221
229
220
207
222
P3x8
230
204
221
not supplied
223
219
237
225
203
202
215
201
238
235

No.	Part No.	Description	Remark
201	A-6759-483-A	TAKE-UP BLOCK ASSY (AT), S	
202	3-736-075-01	BRAKE, S SOFT	
203	3-738-212-21	RETAINER, THRUST, REEL TABLE	
204	X-3729-935-3	TABLE ASSY, REEL, SUPPLY	
205	3-733-389-11	SPRING, TENSION	
206	X-3727-797-1	BAND ASSY, TENSION REGULATOR	
207	X-3727-786-1	SHUTTLE (LEFT) ASSY	
208	X-3733-301-1	ROLLER ASSY, GUIDE	
209	X-3727-767-1	BASE ASSY, STABILIZER	
210	1-543-647-11	HEAD, FE	
211	3-736-082-01	RETAINER, TS THRUST	
212	3-741-925-01	RING, RETAINING	
213	X-3727-771-1	STABLILIZER ASSY, TAPE	
214	⚠8-848-537-11	DRUM ASSY (DZH-21A-R) (M901)	234, 236
215	3-736-047-01	SPRING (S SOFT), TENSION	
216	3-736-041-01	NUT (N3), NYLON	
217	A-6761-129-A	HEAD BLOCK ASSY, ACE	
218	3-736-042-01	SPRING, TORSION	
219	3-736-151-11	ARM (POM), TENSION REGULATOR	
220	X-3729-926-1	BRAKE ASSY (2), T	221
221	3-738-220-01	SPRING (MAIN BRAKE 2), TENSION	
222	X-3733-336-2	BRAKE ASSY (2) (AT), S	221
223	3-738-221-01	SPRING (MAIN BRAKE 1), TENSION	
224	*X-3746-005-1	BASE ASSY (G), DRUM	
225	3-736-055-01	SCREW (3X8), TAPPING	
226	3-736-740-01	NUT (M2X0.25), NYLON	
227	3-736-733-01	FLANGE, 7 GUIDE	
228	3-736-730-01	SLEEVE, #7 GUIDE	
229	3-736-729-01	SPRING, COMPRESSION	
230	X-3727-787-1	SHUTTLE (RIGHT) ASSY	
231	X-3727-788-1	ROLLER ASSY, GUIDE, #2	
232	3-736-745-01	SPRING	
233	A-6747-267-C	ARM BLOCK ASSY (S), C ROLLER	
234	8-848-540-01	UPPER DRUM ASSY (DZR-21R)	
235	3-736-073-01	SLIDER, POLYETHYLENE	
236	2-643-205-01	SCREW, FITTING +PW 3X8, UPPER DRUM	
237	3-738-284-01	SPRING, TENSION	
238	*3-738-249-01	PLATE, FIXED, MD	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

5-6. MECHANISM DECK 3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BVTP 3x8
293
288
273
259
285
286
287
271
BVTP 3x10
274
269
289
291
284
281
257
BVTP 3x8
272
275
276
256
283
282
292
280
277
BVTP 3x8
254
255
not supplied
296
279
298
295
253
252
290
251
PS 2.6x5

No.	Part No.	Description	Remark
251	3-736-015-01	WHEEL (CAM), WORM	
252	3-736-158-01	PLATE, SLIDE, PENDULUM	
253	A-6739-084-A	CHASSIS BLOCK ASSY, SUB	255
254	3-736-091-01	PIN, SWITCH	
255	3-669-465-00	WASHER (1.5), STOPPER	
256	1-571-920-11	SWITCH, ROTARY (S1)	
257	3-669-595-00	WASHER (2), STOPPER	
258	3-736-013-01	BELT, TIMING	
259	X-3727-782-1	PULLEY ASSY	
260	3-736-089-01	SPRING, TENSION	
262	X-3727-761-1	ARM ASSY, ADJUSTMENT	
263	*A-6754-055-A	MD-40 BOARD, COMPLETE	264, 265, 293
264	3-736-149-01	HOLDER, ST SENSOR	
265	*3-736-144-01	HOLDER, LED	
267	3-736-177-01	PLATE, SLIDE, MODE	
268	3-733-394-01	GEAR, RVS RELAY	
269	3-736-073-01	SLIDER, POLYETHYLENE	
270	3-736-148-01	GEAR (RIGHT), THREADING	
271	3-736-092-01	SPRING (RIGHT), TORSION	
272	X-3727-777-1	ARM (RIGHT) ASSY, THREADING	
273	3-736-147-01	GEAR (LEFT), THREADING	
274	3-736-040-01	SPRING (LEFT), TORSION	

No.	Part No.	Description	Remark
275	X-3727-778-1	ARM (LEFT) ASSY, THREADING	
276	3-736-142-01	ARM, TENSION REGULATOR FUNCTION	
277	3-736-140-03	ARM, S TAKE-UP	
278	X-3733-302-1	MOTOR ASSY, CAM (M903)	295
279	3-733-395-01	GEAR (CAM), WORM	
280	3-733-397-01	ARM, BRAKE FUNCTION	
281	X-3733-338-1	BRAKE ASSY (AT), CAP	
282	3-733-398-04	PLATE, SLIDE, BRAKE	
283	3-736-103-03	PLATE, SLIDE, LIMITER	
284	3-736-016-01	ARM, LIMITER FUNCTION	
285	3-736-170-01	GEAR, RKB CAM	
286	8-835-382-01	MOTOR, DC U-26B (CAPSTAN) (M902)	
287	3-736-744-01	RETAINER, ROTOR	
288	3-733-396-01	HOLDER, CAM GEAR	
289	3-736-176-01	GEAR, CAM	
291	3-736-139-03	ARM, PENDULUM FUNCTION	
292	3-738-237-01	SPRING (CAP BRAKE), TENSION	
293	8-719-974-65	DIODE GL451V (D001)	
295	*1-633-460-11	CA-41 BOARD	
296	3-741-950-01	SPRING (AT), LEAF, SC GROUND	
297	3-733-386-01	SCREW (3X8), WASHER	

CA-42

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- -XX, -X mean standardized parts, so they may have some differences from the original one.
- SEMICONDUCTORS
  In each case, U: μ, for example:
  UA. . . : μA. . . , UPA. . . : μPA. . . ,
  UPB. . . : μPB. . . , UPC. . . : μPC. . . ,
  UPD. . . : μPD. . .
- CAPACITORS
  MF: μF, PF: μμF
- COILS
  MMH: mH, UH: μH

Ref.No	Part No.	Description				Remark
	*A-6713-386-A	CA-42 BOARD, COMPLETE **********************				
	*3-746-016-02	CASE (MAIN), AU				
	*3-746-017-01	CASE (LOWER), AU				
		CAPACITOR				
C101	1-161-047-00	CERAMIC	0.0047MF	10%	25V	
C102	1-164-070-11	CERAMIC	100PF	5%	50V	
C103	1-162-839-11	CERAMIC	0.01MF	10%	16V	
C104	1-126-157-11	ELECT	10MF	20%	6.3V	
C105	1-164-091-11	CERAMIC	0.0022MF	10%	50V	
C106	1-124-499-11	ELECT	1MF	20%	50V	
C107	1-164-097-11	CERAMIC	0.022MF		50V	
C108	1-126-154-11	ELECT	47MF	20%	6.3V	
C109	1-126-160-11	ELECT	1MF	20%	50V	
C110	1-164-046-11	CERAMIC	10PF	0.5PF	50V	
C111	1-126-154-11	ELECT	47MF	20%	6.3V	
C112	1-164-096-11	CERAMIC	0.01MF		50V	
C113	1-126-154-11	ELECT	47MF	20%	6.3V	
C250	1-109-675-11	MICA	120PF	5%	500V	
C251	1-124-589-11	ELECT	47MF	20%	10V	
C252	1-164-083-11	CERAMIC	680PF	10%	50V	
C254	1-164-092-11	CERAMIC	0.0033MF	10%	25V	
C255	1-126-160-11	ELECT	1MF	20%	50V	
C256	1-124-465-00	ELECT	0.47MF	20%	50V	
C257	1-124-589-11	ELECT	47MF	20%	10V	
C258	1-130-483-00	MYLAR	0.01MF	5%	50V	
C259	1-126-160-11	ELECT	1MF	20%	50V	
C260	1-164-085-11	CERAMIC	0.001MF	10%	50V	
C261	1-124-234-00	ELECT	22MF	20%	10V	
C263	1-164-086-11	CERAMIC	0.0012MF	10%	50V	
C264	1-102-978-00	CERAMIC	220PF	5%	50V	
C265	1-126-160-11	ELECT	1MF	20%	50V	
C266	1-124-589-11	ELECT	47MF	20%	10V	
C267	1-124-589-11	ELECT	47MF	20%	10V	
C268	1-126-160-11	ELECT	1MF	20%	50V	
C269	1-126-160-11	ELECT	1MF	20%	50V	
C270	1-126-160-11	ELECT	1MF	20%	50V	
C271	1-130-488-00	MYLAR	0.027MF	5%	50V	
C273	1-130-488-00	MYLAR	0.027MF	5%	50V	
C274	1-126-094-11	ELECT	4.7MF	20%	16V	
C275	1-124-589-11	ELECT	47MF	20%	10V	
C276	1-164-087-11	CERAMIC	0.0015MF	10%	50V	
C277	1-162-839-11	CERAMIC	0.01MF	10%	16V	
C278	1-136-558-11	FILM	0.0039MF	10%	630V	
C285	1-164-083-11	CERAMIC	680PF	10%	50V	
		CONNECTOR				
CN101	1-506-482-11	PIN, CONNECTOR 3P				
CN102	*1-563-465-11	SOCKET, CONNECTOR 14P				
CN201	*1-563-676-11	SOCKET, CONNECTOR 9P				
CN213	1-506-482-11	PIN, CONNECTOR 3P				
CN214	1-506-469-11	PIN, CONNECTOR 4P				
CN215	1-506-468-11	PIN, CONNECTOR 3P				
		DIODE				
D101	8-719-911-19	DIODE 1SS19				
D102	8-719-991-19	DIODE 1SS19				
D103	8-719-991-19	DIODE 1SS19				
D104	8-719-991-19	DIODE 1SS19				
D105	8-719-991-19	DIODE 1SS19				
D106	8-719-991-19	DIODE 1SS19				
		IC				
IC101	8-759-632-58	IC M52435P				
IC102	8-759-000-49	IC MC14066BCP				
IC257	8-759-805-20	IC LA7297				
		COIL				
L101	1-408-413-00	INDUCTOR	22UH			
L251	1-410-070-21	INDUCTOR	8.2MMH			
L252	1-412-092-11	INDUCTOR, SMALL TYPE	22MMH			
L253	1-410-687-11	INDUCTOR	1.2MMH			
L255	1-408-409-00	INDUCTOR	10UH			
		TRANSISTOR				
Q101	8-729-920-70	TRANSISTOR 2SC1740S-QR				
Q102	8-729-900-89	TRANSISTOR DTC144ES				
Q103	8-729-900-89	TRANSISTOR DTC144ES				
Q104	8-729-115-10	TRANSISTOR 2SK105A-10				
Q107	8-729-920-70	TRANSISTOR 2SC1740S-QR				
Q251	8-729-926-14	TRANSISTOR 2SD1292				
		RESISTOR				
R101	1-249-437-11	CARBON	47K	5%	1/4W	
R102	1-249-433-11	CARBON	22K	5%	1/4W	
R103	1-249-433-11	CARBON	22K	5%	1/4W	
R104	1-249-429-11	CARBON	10K	5%	1/4W	
R105	1-249-433-11	CARBON	22K	5%	1/4W	
R106	1-249-429-11	CARBON	10K	5%	1/4W	
R107	1-249-429-11	CARBON	10K	5%	1/4W	
R108	1-247-887-00	CARBON	220K	5%	1/4W	
R109	1-249-441-11	CARBON	100K	5%	1/4W	
R110	1-249-405-11	CARBON	100	5%	1/4W	
R111	1-247-885-00	CARBON	180K	5%	1/4W	
R112	1-247-887-00	CARBON	220K	5%	1/4W	
R113	1-249-429-11	CARBON	10K	5%	1/4W	
R114	1-247-889-00	CARBON	270K	5%	1/4W	
R115	1-249-413-11	CARBON	470	5%	1/4W	
R116	1-249-417-11	CARBON	1K	5%	1/4W	
R117	1-249-429-11	CARBON	10K	5%	1/4W	
R118	1-249-437-11	CARBON	47K	5%	1/4W	
R119	1-249-429-11	CARBON	10K	5%	1/4W	
R120	1-249-429-11	CARBON	10K	5%	1/4W	
R121	1-249-433-11	CARBON	22K	5%	1/4W	

Ref.No	Part No.	Description				Remark
R122	1-249-427-11	CARBON	6.8K	5%	1/4W	
R124	1-249-433-11	CARBON	22K	5%	1/4W	
R125	1-249-437-11	CARBON	47K	5%	1/4W	
R126	1-249-437-11	CARBON	47K	5%	1/4W	
R127	1-249-429-11	CARBON	10K	5%	1/4W	
R128	1-249-433-11	CARBON	22K	5%	1/4W	
R129	1-249-437-11	CARBON	47K	5%	1/4W	
R252	1-249-393-11	CARBON	10	5%	1/4W	
R253	1-249-412-11	CARBON	390	5%	1/4W	
R254	1-249-411-11	CARBON	330	5%	1/4W	
R255	1-247-885-00	CARBON	180K	5%	1/4W	
R256	1-249-430-11	CARBON	12K	5%	1/4W	
R257	1-249-437-11	CARBON	47K	5%	1/4W	
R258	1-249-436-11	CARBON	39K	5%	1/4W	
R259	1-249-423-11	CARBON	3.3K	5%	1/4W	
R260	1-247-903-00	CARBON	1M	5%	1/4W	
R262	1-249-441-11	CARBON	100K	5%	1/4W	
R263	1-249-432-11	CARBON	18K	5%	1/4W	
R264	1-249-429-11	CARBON	10K	5%	1/4W	
R265	1-249-429-11	CARBON	10K	5%	1/4W	
R266	1-249-429-11	CARBON	10K	5%	1/4W	
R267	1-249-429-11	CARBON	10K	5%	1/4W	
R268	1-249-429-11	CARBON	10K	5%	1/4W	
R269	1-249-407-11	CARBON	150	5%	1/4W	
R270	1-249-422-11	CARBON	2.7K	5%	1/4W	
R272	1-249-416-11	CARBON	820	5%	1/4W	
R273	1-249-428-11	CARBON	8.2K	5%	1/4W	
R274	1-249-429-11	CARBON	10K	5%	1/4W	
R275	1-249-387-11	CARBON	3.3	5%	1/4W	F
R276	1-249-433-11	CARBON	22K	5%	1/4W	
R291	1-249-436-11	CARBON	39K	5%	1/4W	

VARIABLE RESISTOR

RV251	1-230-500-11	RES, ADJ, CARBON 220K

TRANSFORMER

T251	1-433-330-11	TRANSFORMER, BIAS OSCILLATION

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*A-6721-330-A MF-97 BOARD, COMPLETE

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*3-744-220-04 HOLDER, FL

CAPACITOR

Ref.No	Part No.	Description				Remark
C001	1-164-027-11	CERAMIC	22PF	5%	50V	
C002	1-164-056-11	CERAMIC	27PF	5%	50V	
C003	1-164-056-11	CERAMIC	27PF	5%	50V	
C004	1-164-159-11	CERAMIC	0.1MF		50V	
C005	1-164-159-11	CERAMIC	0.1MF		50V	
C006	1-125-486-11	DOUBLE LAYERS	0.22F		5.5V	
C007	1-164-159-11	CERAMIC	0.1MF		50V	
C008	1-126-096-11	ELECT	10MF	20%	35V	
C009	1-164-159-11	CERAMIC	0.1MF		50V	
C010	1-161-327-00	CERAMIC	0.0033MF	30%	16V	
C012	1-161-374-11	CERAMIC	0.0015MF	30%	16V	
C095	1-161-379-00	CERAMIC	0.01MF	30%	16V	
C096	1-161-379-00	CERAMIC	0.01MF	30%	16V	
C097	1-161-379-00	CERAMIC	0.01MF	30%	16V	
C099	1-161-379-00	CERAMIC	0.01MF	30%	16V	

CONNECTOR

CN001	1-569-342-11	CONNECTOR, BOARD TO BOARD 19P
CN002	1-569-342-11	CONNECTOR, BOARD TO BOARD 19P
CN003	1-565-309-11	CONNECTOR, FLEXIBLE 4P
CN004	1-569-339-11	CONNECTOR, BOARD TO BOARD 7P
CN005	1-568-673-11	CONNECTOR, BOARD TO BOARD 14P

TRIMMER

CV001	1-141-291-11	CAP, TRIMMER 20PF

DIODE

D001	8-719-974-59	DIODE 1SR139-100
D002	8-719-974-59	DIODE 1SR139-100
D004	8-719-947-35	DIODE RD8.2ES-B2
D010	8-719-109-97	DIODE RD6.8ES-B2
D011	8-719-109-97	DIODE RD6.8ES-B2
D012	8-719-947-27	DIODE MTZJ-T-72-6.8

INDICATOR TUBE

FL001	1-519-580-11	INDICATOR TUBE, FLUORESCENT

IC

IC001	8-752-813-21	IC CXP50116-050Q
IC002	8-759-995-76	IC PST529C
IC003	8-759-971-15	IC PST529H

RESISTOR

R001	1-249-433-11	CARBON	22K	5%	1/4W
R002	1-247-895-00	CARBON	470K	5%	1/4W
R004	1-249-423-11	CARBON	3.3K	5%	1/4W
R005	1-249-419-11	CARBON	1.5K	5%	1/4W
R007	1-249-429-11	CARBON	10K	5%	1/4W
R009	1-249-419-11	CARBON	1.5K	5%	1/4W
R011	1-249-419-11	CARBON	1.5K	5%	1/4W
R012	1-249-420-11	CARBON	1.8K	5%	1/4W
R015	1-249-425-11	CARBON	4.7K	5%	1/4W
R016	1-249-425-11	CARBON	4.7K	5%	1/4W
R017	1-249-425-11	CARBON	4.7K	5%	1/4W
R018	1-249-425-11	CARBON	4.7K	5%	1/4W
R019	1-249-425-11	CARBON	4.7K	5%	1/4W
R020	1-249-425-11	CARBON	4.7K	5%	1/4W
R021	1-249-425-11	CARBON	4.7K	5%	1/4W
R022	1-249-425-11	CARBON	4.7K	5%	1/4W

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R094	1-249-417-11	CARBON	1K	5%	1/4W	
R095	1-249-417-11	CARBON	1K	5%	1/4W	

SWITCH

Ref.No	Part No.	Description	Remark
S001	1-571-977-11	SWITCH, TACTIL (PAUSE)	
S002	1-571-977-11	SWITCH, TACTIL (STOP)	

CRYSTAL

Ref.No	Part No.	Description	Remark
X001	1-567-519-11	VIBRATOR, CRYSTAL (4.19MHz)	
X002	1-567-098-00	VIBRATOR, CRYSTAL (32.768KHz)	

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*A-6725-801-A MA-60 BOARD, COMPLETE

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Ref.No	Part No.	Description	Remark
	1-558-924-41	CABLE, PIN	

BUZZER

Ref.No	Part No.	Description	Remark
BZ501	1-529-070-11	BUZZER	

CAPACITOR

Ref.No	Part No.	Description				Remark
C107	1-126-101-11	ELECT	100MF	20%	16V	
C110	1-124-589-11	ELECT	47MF	20%	10V	
C201	1-162-839-11	CERAMIC	0.01MF	10%	16V	
C202	1-164-058-11	CERAMIC	33PF	5%	50V	
C203	1-102-824-00	CERAMIC	470PF	5%	50V	
C204	1-164-056-11	CERAMIC	27PF	5%	50V	
C205	1-162-839-11	CERAMIC	0.01MF	10%	16V	
C206	1-161-772-11	CERAMIC	0.1MF	20%	16V	
C207	1-124-234-00	ELECT	22MF	20%	16V	
C208	1-162-839-11	CERAMIC	0.01MF	10%	16V	
C303	1-130-483-00	MYLAR	0.01MF	5%	50V	
C304	1-124-120-11	ELECT	220MF	20%	25V	
C351	1-130-495-00	MYLAR	0.1MF	5%	50V	
C352	1-124-234-00	ELECT	22MF	20%	16V	
C353	1-164-096-11	CERAMIC	0.01MF		50V	
C355	1-126-157-11	ELECT	10MF	20%	16V	
C356	1-161-772-11	CERAMIC	0.1MF	20%	16V	
C401	1-162-847-11	CERAMIC	0.047MF	20%	16V	
C402	1-162-847-11	CERAMIC	0.047MF	20%	16V	
C403	1-124-589-11	ELECT	47MF	20%	10V	
C404	1-102-961-00	CERAMIC	27PF	5%	50V	
C405	1-164-060-11	CERAMIC	39PF	5%	50V	
C406	1-124-589-11	ELECT	47MF	20%	16V	
C407	1-164-058-11	CERAMIC	33PF	5%	50V	(SLV-373VP)
C408	1-126-096-11	ELECT	10MF	20%	25V	
C409	1-124-589-11	ELECT	47MF	20%	10V	
C410	1-162-839-11	CERAMIC	0.01MF	10%	16V	
C411	1-124-589-11	ELECT	47MF	20%	10V	
C413	1-162-839-11	CERAMIC	0.01MF	10%	16V	
C414	1-162-839-11	CERAMIC	0.01MF	10%	16V	
C415	1-162-203-31	CERAMIC	15PF	5%	50V	
C416	1-164-025-91	CERAMIC	18PF	5%	50V	
C417	1-162-839-11	CERAMIC	0.01MF	10%	16V	
C419	1-162-857-91	CERAMIC	0.0047MF	20%	16V	
C420	1-164-085-11	CERAMIC	0.001MF	10%	50V	
C421	1-124-925-11	ELECT	2.2MF	20%	50V	
C423	1-124-589-11	ELECT	47MF	20%	16V	
C424	1-162-839-11	CERAMIC	0.01MF	10%	16V	
C450	1-161-772-11	CERAMIC	0.1MF	20%	16V	
C451	1-126-154-11	ELECT	47MF	20%	6.3V	
C452	1-161-772-11	CERAMIC	0.1MF	20%	16V	
C453	1-102-980-00	CERAMIC	270PF	5%	50V	
C454	1-102-980-00	CERAMIC	270PF	5%	50V	
C457	1-164-091-11	CERAMIC	0.0022MF	10%	50V	
C458	1-162-843-11	CERAMIC	0.022MF	20%	16V	
C459	1-126-160-11	ELECT	1MF	20%	50V	
C461	1-164-082-11	CERAMIC	560PF	10%	50V	
C466	1-124-589-11	ELECT	47MF	20%	16V	
C467	1-162-839-11	CERAMIC	0.01MF	10%	16V	
C501	1-124-584-00	ELECT	100MF	20%	10V	
C502	1-164-159-11	CERAMIC	0.1MF		50V	
C503	1-162-839-11	CERAMIC	0.01MF	10%	16V	
C504	1-164-049-11	CERAMIC	13PF	5%	50V	
C505	1-164-049-11	CERAMIC	13PF	5%	50V	
C506	1-161-772-11	CERAMIC	0.1MF	20%	16V	
C507	1-162-854-91	CERAMIC	0.0015MF	20%	16V	
C551	1-161-772-11	CERAMIC	0.1MF	20%	16V	
C552	1-124-589-11	ELECT	47MF	20%	10V	
C553	1-164-058-11	CERAMIC	33PF	5%	50V	
C554	1-164-058-11	CERAMIC	33PF	5%	50V	
C555	1-162-853-91	CERAMIC	0.001MF	20%	16V	
C601	1-124-925-11	ELECT	2.2MF	20%	50V	
C602	1-124-925-11	ELECT	2.2MF	20%	50V	
C603	1-124-925-11	ELECT	2.2MF	20%	50V	
C604	1-124-925-11	ELECT	2.2MF	20%	50V	
C605	1-124-925-11	ELECT	2.2MF	20%	50V	
C607	1-124-646-91	ELECT	22MF	20%	16V	
C608	1-124-234-00	ELECT	22MF	20%	16V	
C609	1-124-234-00	ELECT	22MF	20%	16V	
C610	1-124-234-00	ELECT	22MF	20%	16V	
C611	1-162-839-11	CERAMIC	0.01MF	10%	16V	
C612	1-161-772-11	CERAMIC	0.1MF	20%	16V	
C613	1-126-101-11	ELECT	100MF	20%	16V	
C614	1-126-154-11	ELECT	47MF	20%	6.3V	
C615	1-126-154-11	ELECT	47MF	20%	6.3V	
C621	1-126-154-11	ELECT	47MF	20%	6.3V	
C622	1-162-839-11	CERAMIC	0.01MF	10%	16V	
C624	1-124-472-11	ELECT	470MF	20%	6.3V	
C625	1-124-443-00	ELECT	100MF	20%	10V	
C626	1-101-361-00	CERAMIC	150PF	5%	50V	
C627	1-101-361-00	CERAMIC	150PF	5%	50V	
C628	1-164-085-11	CERAMIC	0.001MF	10%	50V	
C630	1-164-085-11	CERAMIC	0.001MF	10%	50V	
C632	1-161-772-11	CERAMIC	0.1MF	20%	16V	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
C633	1-126-101-11	ELECT 100MF 20% 16V	
C670	1-126-160-11	ELECT 1MF 20% 50V	
C671	1-126-163-11	ELECT 4.7MF 20% 50V	
C700	1-124-234-00	ELECT 22MF 20% 16V	
C703	1-124-927-11	ELECT 4.7MF 20% 50V	
C705	1-164-096-11	CERAMIC 0.01MF 50V	
C706	1-124-589-11	ELECT 47MF 20% 16V	
C710	1-126-233-11	ELECT 22MF 20% 50V	
C711	1-164-056-11	CERAMIC 27PF 5% 50V	
C713	1-164-056-11	CERAMIC 27PF 5% 50V	(SLV-373UB)
C713	1-164-064-11	CERAMIC 56PF 5% 50V	(SLV-373/373VP)
C715	1-124-443-00	ELECT 100MF 20% 10V	
C716	1-164-065-91	CERAMIC 62PF 5% 50V	(SLV-373/373VP)
C716	1-164-068-11	CERAMIC 82PF 5% 50V	(SLV-373UB)
C717	1-124-242-00	ELECT 33MF 20% 16V	
C718	1-164-089-11	CERAMIC 0.0022MF 50V	
C719	1-164-089-11	CERAMIC 0.0022MF 50V	
C721	1-124-927-11	ELECT 4.7MF 20% 50V	
C723	1-124-499-11	ELECT 1MF 20% 50V	(SLV-373/373UB)
C726	1-124-242-00	ELECT 33MF 20% 16V	
C727	1-161-379-00	CERAMIC 0.01MF 30% 16V	
C751	1-162-827-11	CERAMIC 0.001MF 10% 16V	(SLV-373VP)
C752	1-162-827-11	CERAMIC 0.001MF 10% 16V	(SLV-373VP)
C753	1-162-827-11	CERAMIC 0.001MF 10% 16V	(SLV-373VP)
C754	1-162-827-11	CERAMIC 0.001MF 10% 16V	(SLV-373VP)
C755	1-162-827-11	CERAMIC 0.001MF 10% 16V	(SLV-373VP)
C759	1-126-154-11	ELECT 47MF 20% 6.3V	
C760	1-162-839-11	CERAMIC 0.01MF 10% 16V	
C761	1-164-050-11	CERAMIC 15PF 5% 50V	(SLV-373UB)
C801	1-164-159-11	CERAMIC 0.1MF 50V	(SLV-373VP)
C802	1-162-847-11	CERAMIC 0.047MF 20% 16V	(SLV-373VP)
C803	1-164-058-11	CERAMIC 33PF 5% 50V	(SLV-373VP)
C804	1-162-847-11	CERAMIC 0.047MF 20% 16V	(SLV-373VP)
C805	1-164-058-11	CERAMIC 33PF 5% 50V	(SLV-373VP)
C806	1-161-057-00	CERAMIC 0.033MF 20% 16V	(SLV-373VP)
C810	1-162-284-31	CERAMIC 150PF 10% 50V	(SLV-373VP)
C951	1-124-925-11	ELECT 2.2MF 20% 50V	

FILTER

Ref.No	Part No.	Description	Remark
CF801	1-567-160-21	OSCILLATOR, CERAMIC	

CONNECTOR

Ref.No	Part No.	Description	Remark
CN201	1-569-338-11	CONNECTOR, BOARD TO BOARD 19P	
CN202	1-569-338-11	CONNECTOR, BOARD TO BOARD 19P	
CN203	1-506-982-11	PIN, CONNECTOR 14P	
CN204	1-506-475-11	PIN, CONNECTOR 10P	
CN205	1-506-473-11	PIN, CONNECTOR 8P	
CN206	1-506-476-11	PIN, CONNECTOR 11P	
CN208	1-569-344-11	CONNECTOR, BOARD TO BOARD 19P	
CN209	1-569-344-11	CONNECTOR, BOARD TO BOARD 19P	
CN210	1-569-341-11	CONNECTOR, BOARD TO BOARD 19P	
CN216	1-561-534-00	SOCKET 21P	
CN218	*1-566-249-11	PIN, CONNECTOR 9P	

JACK

Ref.No	Part No.	Description	Remark
CNJ951	1-507-562-00	JACK (SIRCS)	

TRIMMER

Ref.No	Part No.	Description	Remark
CV401	1-141-227-00	CAP, CERAMIC TRIMMER	

DIODE

Ref.No	Part No.	Description	Remark
D301	8-719-911-19	DIODE 1SS119	
D302	8-719-911-19	DIODE 1SS119	
D303	8-719-911-19	DIODE 1SS119	
D304	8-719-974-59	DIODE 1SR139-100	
D351	8-719-109-85	DIODE RD6.1ES-B2	
D401	8-719-911-19	DIODE 1SS119	
D402	8-719-911-19	DIODE 1SS119	
D403	8-719-911-19	DIODE 1SS119	
D404	8-719-109-97	DIODE RD6.8ES-B2	
D501	8-719-911-19	DIODE 1SS119	
D502	8-719-911-19	DIODE 1SS119	
D503	8-719-911-19	DIODE 1SS119	
D504	8-719-109-97	DIODE RD6.8ES-B2	
D551	8-719-109-97	DIODE RD6.8ES-B2	
D601	8-719-911-19	DIODE 1SS119	
D602	8-719-109-97	DIODE RD6.8ES-B2	
D603	8-719-911-19	DIODE 1SS119	
D604	8-719-911-19	DIODE 1SS119	
D670	8-719-911-19	DIODE 1SS119	
D671	8-719-911-19	DIODE 1SS119	
D701	8-719-110-78	DIODE RD33ES-B2	
D901	8-719-109-97	DIODE RD6.8ES-B2	
D902	8-719-109-97	DIODE RD6.8ES-B2	
D903	8-719-109-97	DIODE RD6.8ES-B2	
D951	8-719-911-19	DIODE 1SS119	
D952	8-719-911-19	DIODE 1SS119	
D953	8-719-109-97	DIODE RD6.8ES-B2	

IC

Ref.No	Part No.	Description	Remark
IC101⚠	8-759-983-45	IC BA6238A	
IC103	8-759-923-90	IC BA4560	
IC302	8-759-008-71	IC LM324N	
IC401	8-759-634-22	IC M50554-182SP	
IC402	8-759-996-03	IC LVA519S	
IC501	8-752-813-20	IC CXP80116-VSX350	
IC502	8-759-822-65	IC LC6543H-4374	
IC601	8-759-208-08	IC TC4052BPHB	
IC702	8-759-501-XX	IC ST93C46AB1	
IC801	8-759-030-60	IC SDA5642	(SLV-373VP)
IC802	8-759-147-30	IC UPD75004GB-VSX182	(SLV-373VP)

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

MA-60

Ref.No	Part No.	Description	Remark
		IF BLOCK	
IF701⚠.	1-464-553-21	IF BLOCK (IFB-389) (SLV-373)	
IF701⚠.	1-464-583-21	IF BLOCK (IFB-395) (SLV-373UB)	
IF701⚠.	1-466-034-11	IF BLOCK (IFV-389A)	
		COIL	
L201	1-408-413-00	INDUCTOR 22UH	
L202	1-408-409-00	INDUCTOR 10UH	
L203	1-408-413-00	INDUCTOR 22UH	
L351	1-408-409-00	INDUCTOR 10UH	
L401	1-408-421-00	INDUCTOR 100UH	
L402	1-410-423-11	INDUCTOR 22UH	
L403	1-408-415-00	INDUCTOR 33UH (SLV-373VP)	
L404	1-408-421-00	INDUCTOR 100UH	
L405	1-408-414-00	INDUCTOR 27UH	
L406	1-408-415-00	INDUCTOR 33UH	
L407	1-408-421-00	INDUCTOR 100UH	
L408	1-408-413-00	INDUCTOR 22UH	
L501	1-408-409-00	INDUCTOR 10UH	
L551	1-408-409-00	INDUCTOR 10UH	
L601	1-408-421-00	INDUCTOR 100UH	
L602	1-408-409-00	INDUCTOR 10UH	
L603	1-408-425-00	INDUCTOR 220UH	
L604	1-408-425-00	INDUCTOR 220UH	
L701	1-408-409-00	INDUCTOR 10UH	
L702	1-408-425-00	INDUCTOR 220UH	
L703	1-408-413-00	INDUCTOR 22UH	
L705	1-408-413-00	INDUCTOR 22UH (SLV-373UB)	
L705	1-408-415-00	INDUCTOR 33UH (SLV-373/373VP)	
L706	1-408-409-00	INDUCTOR 10UH	
L752	1-408-409-00	INDUCTOR 10UH	
L753	1-408-409-00	INDUCTOR 10UH	
L754	1-410-509-11	INDUCTOR 10UH (SLV-373VP)	
		TRANSISTOR	
Q103	8-729-900-61	TRANSISTOR DTA114ES	
Q201	8-729-920-70	TRANSISTOR 2SC1740S-QR	
Q202	8-729-920-70	TRANSISTOR 2SC1740S-QR	
Q203	8-729-920-70	TRANSISTOR 2SC1740S-QR	
Q204	8-729-920-70	TRANSISTOR 2SC1740S-QR	
Q301	8-729-900-89	TRANSISTOR DTC144ES	
Q302	8-729-920-68	TRANSISTOR 2SA933S-QR	
Q304	8-729-920-70	TRANSISTOR 2SC1740S-QR	
Q401	8-729-920-70	TRANSISTOR 2SC1740S-QR (SLV-373VP)	
Q402	8-729-920-70	TRANSISTOR 2SC1740S-QR	
Q403	8-729-920-70	TRANSISTOR 2SC1740S-QR	
Q404	8-729-920-68	TRANSISTOR 2SA933S-QR	
Q405	8-729-900-89	TRANSISTOR DTC144ES (SLV-373VP)	
Q406	8-729-920-68	TRANSISTOR 2SA933S-QR	
Q407	8-729-920-70	TRANSISTOR 2SC1740S-QR	
Q451	8-729-920-70	TRANSISTOR 2SC1740S-QR	
Q501	8-729-900-89	TRANSISTOR DTC144ES	
Q515	8-729-900-89	TRANSISTOR DTC144ES	
Q601	8-729-920-70	TRANSISTOR 2SC1740S-QR	
Q602	8-729-920-70	TRANSISTOR 2SC1740S-QR	
Q603	8-729-920-70	TRANSISTOR 2SC1740S-QR	
Q604	8-729-900-65	TRANSISTOR DTA144ES	
Q608	8-729-920-68	TRANSISTOR 2SA933S-QR	
Q609	8-729-900-89	TRANSISTOR DTC144ES	
Q610	8-729-920-68	TRANSISTOR 2SA933S-QR	
Q670	8-729-920-70	TRANSISTOR 2SC1740S-QR	
Q710	8-729-920-70	TRANSISTOR 2SC1740S-QR	
Q711	8-729-920-70	TRANSISTOR 2SC1740S-QR	
Q712	8-729-920-68	TRANSISTOR 2SA933S-QR	
Q751	8-729-920-70	TRANSISTOR C1740S-QR	
Q951	8-729-900-89	TRANSISTOR DTC144ES	
Q952	8-729-900-63	TRANSISTOR DTA124ES	
		RESISTOR	
R117	1-249-413-11	CARBON 470 5% 1/4W	
R118	1-249-425-11	CARBON 4.7K 5% 1/4W	
R201	1-249-431-11	CARBON 15K 5% 1/4W	
R202	1-249-430-11	CARBON 12K 5% 1/4W	
R203	1-249-417-11	CARBON 1K 5% 1/4W	
R204	1-249-417-11	CARBON 1K 5% 1/4W	
R205	1-249-418-11	CARBON 1.2K 5% 1/4W	
R206	1-249-417-11	CARBON 1K 5% 1/4W	
R207	1-247-897-11	CARBON 560K 5% 1/4W	
R208	1-249-421-11	CARBON 2.2K 5% 1/4W	
R209	1-249-428-11	CARBON 8.2K 5% 1/4W	
R210	1-249-421-11	CARBON 2.2K 5% 1/4W	
R211	1-249-412-11	CARBON 390 5% 1/4W	
R212	1-249-405-11	CARBON 100 5% 1/4W	
R213	1-249-437-11	CARBON 47K 5% 1/4W	
R214	1-249-427-11	CARBON 6.8K 5% 1/4W	
R215	1-249-435-11	CARBON 33K 5% 1/4W	
R216	1-249-429-11	CARBON 10K 5% 1/4W	
R301	1-247-885-00	CARBON 180K 5% 1/4W	
R302	1-249-417-11	CARBON 1K 5% 1/4W	
R303	1-249-423-11	CARBON 3.3K 5% 1/4W	
R304	1-249-421-11	CARBON 2.2K 5% 1/4W	
R305	1-249-423-11	CARBON 3.3K 5% 1/4W	
R306	1-249-423-11	CARBON 3.3K 5% 1/4W	
R309	1-247-889-00	CARBON 270K 5% 1/4W	
R310 ⚠.	1-247-744-11	CARBON 270 5% 1/2W	F
R312	1-249-441-11	CARBON 100K 5% 1/4W	
R313	1-249-426-11	CARBON 5.6K 5% 1/4W	
R351	1-249-436-11	CARBON 39K 5% 1/4W	
R352	1-249-417-11	CARBON 1K 5% 1/4W	
R353	1-249-435-11	CARBON 33K 5% 1/4W	
R355	1-249-429-11	CARBON 10K 5% 1/4W	
R356	1-249-429-11	CARBON 10K 5% 1/4W	
R359	1-249-435-11	CARBON 33K 5% 1/4W	
R401	1-249-429-11	CARBON 10K 5% 1/4W	
R403	1-249-421-11	CARBON 2.2K 5% 1/4W	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R404	1-249-413-11	CARBON	470	5%	1/4W	
R405	1-249-413-11	CARBON	470	5%	1/4W	
R406	1-249-425-11	CARBON	4.7K	5%	1/4W	
R407	1-249-431-11	CARBON	15K	5%	1/4W	
R408	1-249-435-11	CARBON	33K	5%	1/4W	
R409	1-249-403-11	CARBON	68	5%	1/4W	
R410	1-249-429-11	CARBON	10K	5%	1/4W	(SLV-373VP)
R411	1-249-423-11	CARBON	3.3K	5%	1/4W	
R412	1-249-405-11	CARBON	100	5%	1/4W	
R413	1-249-414-11	CARBON	560	5%	1/4W	
R414	1-249-433-11	CARBON	22K	5%	1/4W	
R415	1-249-409-11	CARBON	220	5%	1/4W	
R416	1-249-435-11	CARBON	33K	5%	1/4W	
R417	1-249-431-11	CARBON	15K	5%	1/4W	
R419	1-249-414-11	CARBON	560	5%	1/4W	
R419	1-249-419-11	CARBON	1.5K	5%	1/4W	
R420	1-249-420-11	CARBON	1.8K	5%	1/4W	
R421	1-249-428-11	CARBON	8.2K	5%	1/4W	
R422	1-249-417-11	CARBON	1K	5%	1/4W	
R425	1-249-422-11	CARBON	2.7K	5%	1/4W	
R426	1-249-421-11	CARBON	2.2K	5%	1/4W	
R427	1-249-415-11	CARBON	680	5%	1/4W	
R428	1-249-414-11	CARBON	560	5%	1/4W	
R429	1-249-422-11	CARBON	2.7K	5%	1/4W	
R430	1-249-424-11	CARBON	3.9K	5%	1/4W	
R431	1-249-421-11	CARBON	2.2K	5%	1/4W	
R432	1-249-423-11	CARBON	3.3K	5%	1/4W	
R433	1-249-429-11	CARBON	10K	5%	1/4W	(SLV-373VP)
R434	1-249-419-11	CARBON	1.5K	5%	1/4W	
R435	1-247-903-00	CARBON	1M	5%	1/4W	
R436	1-249-422-11	CARBON	2.7K	5%	1/4W	
R437	1-249-429-11	CARBON	10K	5%	1/4W	
R438	1-249-424-11	CARBON	3.9K	5%	1/4W	
R451	1-249-429-11	CARBON	10K	5%	1/4W	
R452	1-249-429-11	CARBON	10K	5%	1/4W	
R453	1-249-422-11	CARBON	2.7K	5%	1/4W	
R454	1-249-434-11	CARBON	27K	5%	1/4W	
R456	1-249-429-11	CARBON	10K	5%	1/4W	
R457	1-247-903-00	CARBON	1M	5%	1/4W	
R458	1-249-414-11	CARBON	560	5%	1/4W	
R459	1-249-418-11	CARBON	1.2K	5%	1/4W	
R460	1-249-417-11	CARBON	1K	5%	1/4W	
R461	1-249-441-11	CARBON	100K	5%	1/4W	
R501	1-249-429-11	CARBON	10K	5%	1/4W	
R502	1-249-429-11	CARBON	10K	5%	1/4W	
R503	1-249-429-11	CARBON	10K	5%	1/4W	
R504	1-249-417-11	CARBON	1K	5%	1/4W	
R505	1-249-433-11	CARBON	22K	5%	1/4W	
R506	1-249-433-11	CARBON	22K	5%	1/4W	
R507	1-249-433-11	CARBON	22K	5%	1/4W	
R508	1-249-433-11	CARBON	22K	5%	1/4W	
R509	1-249-433-11	CARBON	22K	5%	1/4W	
R510	1-249-433-11	CARBON	22K	5%	1/4W	
R511	1-249-414-11	CARBON	560	5%	1/4W	
R512	1-249-417-11	CARBON	1K	5%	1/4W	
R513	1-249-429-11	CARBON	10K	5%	1/4W	
R514	1-249-429-11	CARBON	10K	5%	1/4W	
R515	1-249-417-11	CARBON	1K	5%	1/4W	
R516	1-249-441-11	CARBON	100K	5%	1/4W	
R517	1-249-433-11	CARBON	22K	5%	1/4W	
R518	1-249-433-11	CARBON	22K	5%	1/4W	
R524	1-249-429-11	CARBON	10K	5%	1/4W	
R525	1-249-429-11	CARBON	10K	5%	1/4W	
R528	1-249-429-11	CARBON	10K	5%	1/4W	
R553	1-249-433-11	CARBON	22K	5%	1/4W	
R554	1-249-433-11	CARBON	22K	5%	1/4W	
R555	1-249-413-11	CARBON	470	5%	1/4W	
R556	1-249-417-11	CARBON	1K	5%	1/4W	
R560	1-249-437-11	CARBON	47K	5%	1/4W	
R601	1-249-437-11	CARBON	47K	5%	1/4W	
R602	1-249-437-11	CARBON	47K	5%	1/4W	
R604	1-249-437-11	CARBON	47K	5%	1/4W	
R606	1-249-437-11	CARBON	47K	5%	1/4W	
R607	1-249-429-11	CARBON	10K	5%	1/4W	
R608	1-249-429-11	CARBON	10K	5%	1/4W	
R609	1-249-429-11	CARBON	10K	5%	1/4W	
R610	1-249-429-11	CARBON	10K	5%	1/4W	
R611	1-249-429-11	CARBON	10K	5%	1/4W	
R612	1-249-417-11	CARBON	1K	5%	1/4W	
R613	1-249-417-11	CARBON	1K	5%	1/4W	
R614	1-249-437-11	CARBON	47K	5%	1/4W	
R615	1-249-439-11	CARBON	68K	5%	1/4W	
R616	1-249-421-11	CARBON	2.2K	5%	1/4W	
R617	1-249-429-11	CARBON	10K	5%	1/4W	
R618	1-249-427-11	CARBON	6.8K	5%	1/4W	
R619	1-249-419-11	CARBON	1.5K	5%	1/4W	
R620	1-249-421-11	CARBON	2.2K	5%	1/4W	
R634	1-249-417-11	CARBON	1K	5%	1/4W	
R635	1-249-417-11	CARBON	1K	5%	1/4W	
R636	1-249-426-11	CARBON	5.6K	5%	1/4W	
R637	1-249-426-11	CARBON	5.6K	5%	1/4W	
R638	1-249-408-11	CARBON	180	5%	1/4W	
R639	1-249-404-00	CARBON	82	5%	1/4W	
R640	1-249-406-11	CARBON	120	5%	1/4W	
R641	1-249-406-11	CARBON	120	5%	1/4W	
R642	1-249-403-11	CARBON	68	5%	1/4W	
R644	1-249-426-11	CARBON	5.6K	5%	1/4W	
R645	1-249-417-11	CARBON	1K	5%	1/4W	
R670	1-249-413-11	CARBON	470	5%	1/4W	
R671	1-249-429-11	CARBON	10K	5%	1/4W	
R672	1-249-429-11	CARBON	10K	5%	1/4W	
R700	1-249-435-11	CARBON	33K	5%	1/4W	
R708	1-249-417-11	CARBON	1K	5%	1/4W	
R709	1-249-417-11	CARBON	1K	5%	1/4W	
R712	1-249-409-11	CARBON	220	5%	1/4W	
R713	1-249-417-11	CARBON	1K	5%	1/4W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
R714	1-249-421-11	CARBON 2.2K 5% 1/4W	
R715	1-249-405-11	CARBON 100 5% 1/4W	
R716	1-249-417-11	CARBON 1K 5% 1/4W	
R717	1-249-417-11	CARBON 1K 5% 1/4W	
R720	1-249-417-11	CARBON 1K 5% 1/4W	
R722	1-249-417-11	CARBON 1K 5% 1/4W	
R723	1-249-417-11	CARBON 1K 5% 1/4W	
R725	1-247-826-00	CARBON 620 5% 1/4W	(SLV-373UB)
R725	1-249-417-11	CARBON 1K 5% 1/4W	(SLV-373/373VP)
R726	1-247-883-00	CARBON 150K 5% 1/4W	(SLV-373/373UB)
R727	1-247-883-00	CARBON 150K 5% 1/4W	(SLV-373/373UB)
R728	1-249-405-11	CARBON 100 5% 1/4W	
R730	1-249-424-11	CARBON 3.9K 5% 1/4W	(SLV-373/373UB)
R731	1-249-429-11	CARBON 10K 5% 1/4W	(SLV-373/373UB)
R732	1-249-417-11	CARBON 1K 5% 1/4W	
R735	1-249-421-11	CARBON 2.2K 5% 1/4W	(SLV-373VP)
R737	1-249-424-11	CARBON 3.9K 5% 1/4W	(SLV-373VP)
R739	1-249-417-11	CARBON 1K 5% 1/4W	
R740	1-249-429-11	CARBON 10K 5% 1/4W	
R759	1-249-438-11	CARBON 56K 5% 1/4W	(SLV-373/373UB)
R760	1-249-438-11	CARBON 56K 5% 1/4W	(SLV-373/373UB)
R801	1-249-429-11	CARBON 10K 5% 1/4W	(SLV-373VP)
R802	1-249-429-11	CARBON 10K 5% 1/4W	(SLV-373VP)
R803	1-249-441-11	CARBON 100K 5% 1/4W	(SLV-373VP)
R804	1-247-901-11	CARBON 820K 5% 1/4W	(SLV-373VP)
R805	1-249-405-11	CARBON 100 5% 1/4W	(SLV-373VP)
R806	1-247-901-11	CARBON 820K 5% 1/4W	(SLV-373VP)
R807	1-249-426-11	CARBON 5.6K 5% 1/4W	(SLV-373VP)
R808	1-247-903-00	CARBON 1M 5% 1/4W	(SLV-373VP)
R810	1-249-421-11	CARBON 2.2K 5% 1/4W	(SLV-373VP)
R811	1-249-429-11	CARBON 10K 5% 1/4W	(SLV-373VP)
R812	1-249-429-11	CARBON 10K 5% 1/4W	(SLV-373VP)
R951	1-249-421-11	CARBON 2.2K 5% 1/4W	

MODULATOR

Ref.No	Part No.	Description	Remark
RF401⚠	1-466-328-11	MODULATOR, RF (RFU-2017)	(SLV-373/373VP)
RF401⚠	1-466-347-11	MODULATOR, RF (RFU-2024)	(SLV-373UB)

VARIABLE RESISTOR

Ref.No	Part No.	Description	Remark
RV451	1-238-015-11	RES, ADJ, CARBON 4.7K	
RV501	1-238-019-11	RES, ADJ, CARBON 47K	

TUNER

Ref.No	Part No.	Description	Remark
TU701	1-465-260-11	TUNER, ET (BTP-2C401)	(SLV-373/373VP)
TU701	1-465-262-11	TUNER, ET (BTP-2U601)	(SLV-373UB)

CRYSTAL

Ref.No	Part No.	Description	Remark
X401	1-577-289-11	VIBRATOR, CRYSTAL 17.7MHZ	
X501	1-577-383-11	VIBRATOR, CRYSTAL 16MHz	
X551	1-567-192-11	OSCILLATOR, CERAMIC 4MHz	

Ref.No	Part No.	Description	Remark
	*A-6727-187-A	YC-90 BOARD, COMPLETE **********************	
	*3-738-015-01	COVER, (DIA. 6) CARBON VR	
	*3-746-013-01	HOLDER (Y), PC BOARD	

CAPACITOR

Ref.No	Part No.	Description			Remark
C701	1-164-095-11	CERAMIC	0.01MF	10%	16V
C702	1-164-096-11	CERAMIC	0.01MF		50V
C703	1-124-927-11	ELECT	4.7MF	20%	50V
C704	1-126-233-11	ELECT	22MF	20%	25V
C705	1-162-851-11	CERAMIC	0.1MF	10%	16V
C706	1-124-927-11	ELECT	4.7MF	20%	50V
C707	1-124-927-11	ELECT	4.7MF	20%	50V
C708	1-164-046-11	CERAMIC	10PF	0.5PF	50V
C709	1-124-446-11	ELECT	47MF	20%	10V
C710	1-164-098-11	CERAMIC	0.047MF		12V
C711	1-102-820-00	CERAMIC	330PF	5%	50V
C712	1-102-822-00	CERAMIC	390PF	5%	50V
C713	1-162-293-31	CERAMIC	820PF	10%	50V
C714	1-164-096-11	CERAMIC	0.01MF		50V
C715	1-164-096-11	CERAMIC	0.01MF		50V
C716	1-124-446-11	ELECT	47MF	20%	10V
C718	1-124-927-11	ELECT	4.7MF	20%	50V
C723	1-164-096-11	CERAMIC	0.01MF		50V
C724	1-164-097-11	CERAMIC	0.022MF		50V
C725	1-164-096-11	CERAMIC	0.01MF		50V
C726	1-164-096-11	CERAMIC	0.01MF		50V
C727	1-164-096-11	CERAMIC	0.01MF		50V
C728	1-164-060-11	CERAMIC	39PF	5%	50V
C730	1-164-096-11	CERAMIC	0.01MF		50V
C731	1-124-446-11	ELECT	47MF	20%	10V
C732	1-164-068-11	CERAMIC	82PF	5%	50V
C733	1-164-058-11	CERAMIC	33PF	5%	50V
C734	1-102-824-00	CERAMIC	470PF	5%	50V
C735	1-162-851-11	CERAMIC	0.1MF	10%	16V
C736	1-164-066-11	CERAMIC	68PF	5%	50V
C737	1-164-096-11	CERAMIC	0.01MF		50V
C738	1-124-925-11	ELECT	2.2MF	20%	50V
C739	1-162-280-31	CERAMIC	82PF	10%	50V
C740	1-164-056-11	CERAMIC	27PF	5%	50V
C741	1-124-446-11	ELECT	47MF	20%	10V
C743	1-162-851-11	CERAMIC	0.1MF	10%	16V
C744	1-124-446-11	ELECT	47MF	20%	10V
C746	1-164-096-11	CERAMIC	0.01MF		50V
C747	1-162-851-11	CERAMIC	0.1MF	10%	16V
C749	1-162-851-11	CERAMIC	0.1MF	10%	16V
C750	1-164-096-11	CERAMIC	0.01MF		50V
C751	1-162-851-11	CERAMIC	0.1MF	10%	16V
C753	1-124-446-11	ELECT	47MF	20%	10V
C754	1-164-058-11	CERAMIC	33PF	5%	50V
C755	1-164-072-11	CERAMIC	120PF	5%	50V
C756	1-102-978-00	CERAMIC	220PF	5%	50V

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description			Remark
C760	1-164-096-11	CERAMIC	0.01MF		50V
C763	1-124-927-11	ELECT	4.7MF	20%	50V
C766	1-124-927-11	ELECT	4.7MF	20%	50V
C768	1-164-096-11	CERAMIC	0.01MF		50V
C770	1-102-978-00	CERAMIC	220PF	5%	50V
C780	1-162-851-11	CERAMIC	0.1MF	10%	16V
C782	1-164-068-11	CERAMIC	82PF	5%	50V
C783	1-102-820-00	CERAMIC	330PF	5%	50V
C785	1-164-096-11	CERAMIC	0.01MF		50V
C790	1-164-096-11	CERAMIC	0.01MF		50V
C801	1-162-851-11	CERAMIC	0.1MF	10%	16V
C802	1-124-446-11	ELECT	47MF	20%	10V
C803	1-164-096-11	CERAMIC	0.01MF		50V
C804	1-162-851-11	CERAMIC	0.1MF	10%	16V
C805	1-164-097-11	CERAMIC	0.022MF		50V
C806	1-164-096-11	CERAMIC	0.01MF		50V
C807	1-164-096-11	CERAMIC	0.01MF		50V
C808	1-164-096-11	CERAMIC	0.01MF		50V
C809	1-102-978-00	CERAMIC	220PF	5%	50V
C810	1-102-978-00	CERAMIC	220PF	5%	50V
C811	1-164-031-11	CERAMIC	33PF	5%	50V
C812	1-164-096-11	CERAMIC	0.01MF		50V
C813	1-124-443-00	ELECT	100MF	20%	6.3V
C814	1-124-443-00	ELECT	100MF	20%	6.3V
C815	1-136-169-00	MYLAR	0.22MF	5%	50V
C816	1-124-927-11	ELECT	4.7MF	20%	50V
C817	1-164-096-11	CERAMIC	0.01MF		50V
C818	1-161-061-11	CERAMIC	0.068MF	10%	25V
C819	1-124-443-00	ELECT	100MF	20%	6.3V
C820	1-164-070-11	CERAMIC	100PF	5%	50V
C823	1-124-927-11	ELECT	4.7MF	20%	50V
C825	1-162-851-11	CERAMIC	0.1MF	10%	16V
C826	1-164-098-11	CERAMIC	0.047MF		12V
C827	1-162-851-11	CERAMIC	0.1MF	10%	16V
C828	1-164-096-11	CERAMIC	0.01MF		50V
C829	1-164-096-11	CERAMIC	0.01MF		50V
C830	1-162-851-11	CERAMIC	0.1MF	10%	16V
C831	1-101-361-00	CERAMIC	150PF	5%	50V
C832	1-124-791-11	ELECT	1MF	20%	50V
C833	1-164-096-11	CERAMIC	0.01MF		50V
C834	1-123-382-00	ELECT	3.3MF	20%	50V
C835	1-164-096-11	CERAMIC	0.01MF		50V
C836	1-162-851-11	CERAMIC	0.1MF	10%	16V
C837	1-164-052-11	CERAMIC	18PF	5%	50V
C840	1-164-096-11	CERAMIC	0.01MF		50V
C841	1-164-096-11	CERAMIC	0.01MF		50V
C842	1-164-096-11	CERAMIC	0.01MF		50V
C844	1-164-096-11	CERAMIC	0.01MF		50V
C847	1-124-446-11	ELECT	47MF	20%	10V
C848	1-164-096-11	CERAMIC	0.01MF		50V
C849	1-130-495-00	MYLAR	0.1MF	5%	50V
C850	1-164-091-11	CERAMIC	0.0022MF	10%	50V
C851	1-102-978-00	CERAMIC	220PF	5%	50V

Ref.No	Part No.	Description			Remark
C852	1-162-851-11	CERAMIC	0.1MF	10%	16V
C853	1-124-446-11	ELECT	47MF	20%	10V
C854	1-124-927-11	ELECT	4.7MF	20%	50V
C855	1-124-446-11	ELECT	47MF	20%	10V
C857	1-164-096-11	CERAMIC	0.01MF		50V
C858	1-164-072-11	CERAMIC	120PF	5%	50V
C859	1-123-875-11	ELECT	10MF	20%	50V
C860	1-123-875-11	ELECT	10MF	20%	50V
C861	1-164-092-11	CERAMIC	0.0033MF	10%	25V
C862	1-101-361-00	CERAMIC	150PF	5%	50V
C863	1-124-791-11	ELECT	1MF	20%	50V
C864	1-124-446-11	ELECT	47MF	20%	10V
C865	1-124-446-11	ELECT	47MF	20%	10V
C866	1-124-791-11	ELECT	1MF	20%	50V
C867	1-123-875-11	ELECT	10MF	20%	50V
C868	1-164-077-11	CERAMIC	220PF	10%	50V
C869	1-164-096-11	CERAMIC	0.01MF		50V
C870	1-164-056-11	CERAMIC	27PF	5%	50V
C871	1-164-056-11	CERAMIC	27PF	5%	50V
C872	1-164-096-11	CERAMIC	0.01MF		50V
C873	1-164-054-11	CERAMIC	22PF	5%	50V
C874	1-164-096-11	CERAMIC	0.01MF		50V
C875	1-162-851-11	CERAMIC	0.1MF	10%	16V
C876	1-130-475-00	MYLAR	0.0022MF	5%	50V
C877	1-164-096-11	CERAMIC	0.01MF		50V
C878	1-130-475-00	MYLAR	0.0022MF	5%	50V
C879	1-164-098-11	CERAMIC	0.047MF		12V
C880	1-124-791-11	ELECT	1MF	20%	50V
C881	1-123-875-11	ELECT	10MF	20%	50V
C882	1-123-382-00	ELECT	3.3MF	20%	50V
C883	1-164-096-11	CERAMIC	0.01MF		50V
C884	1-164-096-11	CERAMIC	0.01MF		50V
C885	1-123-875-11	ELECT	10MF	20%	50V
C886	1-162-851-11	CERAMIC	0.1MF	10%	16V
C887	1-162-851-11	CERAMIC	0.1MF	10%	16V
C888	1-123-875-11	ELECT	10MF	20%	50V
C889	1-164-062-11	CERAMIC	47PF	5%	50V
C890	1-164-050-11	CERAMIC	15PF	5%	50V
C891	1-164-066-11	CERAMIC	68PF	5%	50V
C892	1-164-066-11	CERAMIC	68PF	5%	50V
C893	1-124-446-11	ELECT	47MF	20%	10V
C894	1-124-446-11	ELECT	47MF	20%	10V
C895	1-164-096-11	CERAMIC	0.01MF		50V
C896	1-124-446-11	ELECT	47MF	20%	10V
C897	1-124-927-11	ELECT	4.7MF	20%	50V
C898	1-164-096-11	CERAMIC	0.01MF		50V
C899	1-164-085-11	CERAMIC	0.001MF	10%	50V
		CONNECTOR			
CN701	1-506-471-11	PIN, CONNECTOR 6P			
CN702	1-506-473-11	PIN, CONNECTOR 8P			
CN703	1-506-476-11	PIN, CONNECTOR 11P			
CN704	1-506-469-11	PIN, CONNECTOR 4P			

When indicating parts by reference number, please include the board name.

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Ref.No	Part No.	Description	Remark
		DIODE	
D701	8-719-911-19	DIODE 1SS119	
D705	8-719-911-19	DIODE 1SS119	
D801	8-719-911-19	DIODE 1SS119	
		DELAY LINE	
DL801	1-415-602-11	DELAY LINE, GLASS	
		FILTER	
FL701	1-236-312-11	FILTER, BAND PASS	
FL801	1-239-915-11	FILTER, BAND PASS	
FL802	1-236-311-11	FILTER, BAND PASS (5.06MHz)	
FL803	1-527-849-00	FILTER, CERAMIC	
FL850	1-527-943-00	FILTER, CERAMIC (4.5MHz)	
		IC	
IC701	8-759-420-07	IC AN3231K	
IC702	8-752-321-89	IC CXL5003P	
IC801	8-759-320-78	IC HA118016NT	
IC802	8-759-822-05	IC LA7213	
IC850	8-759-904-95	IC BA7007	
IC860	8-759-420-53	IC AN3592K	
IC861	8-759-991-54	IC MSM6989RS	
IC862	8-752-006-12	IC CX20061	
IC863	8-759-822-05	IC LA7213	
		COIL	
L701	1-408-421-00	INDUCTOR 100UH	
L704	1-408-420-00	INDUCTOR 82UH	
L705	1-408-422-00	INDUCTOR 120UH	
L706	1-408-421-00	INDUCTOR 100UH	
L707	1-408-421-00	INDUCTOR 100UH	
L708	1-408-421-00	INDUCTOR 100UH	
L709	1-408-421-00	INDUCTOR 100UH	
L712	1-408-410-00	INDUCTOR 12UH	
L713	1-408-413-00	INDUCTOR 22UH	
L726	1-408-424-00	INDUCTOR 180UH	
L801	1-408-421-00	INDUCTOR 100UH	
L802	1-408-427-00	INDUCTOR 330UH	
L803	1-408-429-00	INDUCTOR 470UH	
L805	1-408-409-00	INDUCTOR 10UH	
L806	1-408-408-00	INDUCTOR 8.2UH	
L807	1-408-408-00	INDUCTOR 8.2UH	
L809	1-407-499-00	INDUCTOR 3.9MMH	
L850	1-407-499-00	INDUCTOR 3.9MMH	
L861	1-408-415-00	INDUCTOR 33UH	
L862	1-408-409-00	INDUCTOR 10UH	
L863	1-408-409-00	INDUCTOR 10UH	
L880	1-408-421-00	INDUCTOR 100UH	
L881	1-408-421-00	INDUCTOR 100UH	
L882	1-408-411-00	INDUCTOR 15UH	
L883	1-408-414-00	INDUCTOR 27UH	
L891	1-408-409-00	INDUCTOR 10UH	
L892	1-408-409-00	INDUCTOR 10UH	
L893	1-408-409-00	INDUCTOR 10UH	
		TRANSISTOR	
Q702	8-729-920-68	TRANSISTOR 2SA933S-QR	
Q704	8-729-900-89	TRANSISTOR DTC144ES	
Q705	8-729-920-70	TRANSISTOR 2SC1740S-QR	
Q706	8-729-920-68	TRANSISTOR 2SA933S-QR	
Q710	8-729-900-89	TRANSISTOR DTC144ES	
Q711	8-729-920-68	TRANSISTOR 2SA933S-QR	
Q721	8-729-920-70	TRANSISTOR 2SC1740S-QR	
Q722	8-729-900-89	TRANSISTOR DTC144ES	
Q723	8-729-900-89	TRANSISTOR DTC144ES	
Q801	8-729-920-70	TRANSISTOR 2SC1740S-QR	
Q803	8-729-920-70	TRANSISTOR 2SC1740S-QR	
Q804	8-729-900-80	TRANSISTOR DTC114ES	
Q805	8-729-920-68	TRANSISTOR 2SA933S-QR	
Q806	8-729-900-89	TRANSISTOR DTC144ES	
Q807	8-729-920-70	TRANSISTOR 2SC1740S-QR	
Q808	8-729-920-70	TRANSISTOR 2SC1740S-QR	
Q809	8-729-920-70	TRANSISTOR 2SC1740S-QR	
Q810	8-729-900-65	TRANSISTOR DTA144ES	
Q813	8-729-903-02	TRANSISTOR DTA143XS	
Q850	8-729-920-70	TRANSISTOR 2SC1740S-QR	
Q851	8-729-920-70	TRANSISTOR 2SC1740S-QR	
Q852	8-729-900-89	TRANSISTOR DTC144ES	
Q860	8-729-920-70	TRANSISTOR 2SC1740S-QR	
Q862	8-729-900-89	TRANSISTOR DTC144ES	
Q880	8-729-920-70	TRANSISTOR 2SC1740S-QR	
Q881	8-729-920-70	TRANSISTOR 2SC1740S-QR	
Q882	8-729-920-68	TRANSISTOR 2SA933S-QR	
Q883	8-729-920-70	TRANSISTOR 2SC1740S-QR	
Q884	8-729-900-89	TRANSISTOR DTC144ES	
		RESISTOR	
R701	1-247-887-00	CARBON 220K 5% 1/4W	
R702	1-249-421-11	CARBON 2.2K 5% 1/4W	
R703	1-249-428-11	CARBON 8.2K 5% 1/4W	
R704	1-249-427-11	CARBON 6.8K 5% 1/4W	
R705	1-249-426-11	CARBON 5.6K 5% 1/4W	
R706	1-249-421-11	CARBON 2.2K 5% 1/4W	
R707	1-247-834-11	CARBON 1.3K 5% 1/4W	
R708	1-247-818-11	CARBON 300 5% 1/4W	
R709	1-249-423-11	CARBON 3.3K 5% 1/4W	
R710	1-249-438-11	CARBON 56K 5% 1/4W	
R713	1-249-421-11	CARBON 2.2K 5% 1/4W	
R714	1-249-425-11	CARBON 4.7K 5% 1/4W	
R717	1-249-420-11	CARBON 1.8K 5% 1/4W	
R718	1-249-422-11	CARBON 2.7K 5% 1/4W	
R719	1-249-426-11	CARBON 5.6K 5% 1/4W	
R720	1-249-424-11	CARBON 3.9K 5% 1/4W	
R722	1-249-419-11	CARBON 1.5K 5% 1/4W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R723	1-249-426-11	CARBON	5.6K	5%	1/4W	
R724	1-249-419-11	CARBON	1.5K	5%	1/4W	
R725	1-249-412-11	CARBON	390	5%	1/4W	
R726	1-249-416-11	CARBON	820	5%	1/4W	
R727	1-249-413-11	CARBON	470	5%	1/4W	
R728	1-247-897-11	CARBON	560K	5%	1/4W	
R729	1-249-437-11	CARBON	47K	5%	1/4W	
R730	1-249-437-11	CARBON	47K	5%	1/4W	
R731	1-249-413-11	CARBON	470	5%	1/4W	
R733	1-249-413-11	CARBON	470	5%	1/4W	
R734	1-249-434-11	CARBON	27K	5%	1/4W	
R735	1-249-429-11	CARBON	10K	5%	1/4W	
R736	1-249-409-11	CARBON	220	5%	1/4W	
R737	1-249-413-11	CARBON	470	5%	1/4W	
R738	1-249-405-11	CARBON	100	5%	1/4W	
R741	1-249-417-11	CARBON	1K	5%	1/4W	
R744	1-247-903-00	CARBON	1M	5%	1/4W	
R754	1-249-412-11	CARBON	390	5%	1/4W	
R755	1-259-880-11	CARBON	2.2M	5%	1/4W	
R761	1-249-437-11	CARBON	47K	5%	1/4W	
R763	1-249-423-11	CARBON	3.3K	5%	1/4W	
R774	1-249-433-11	CARBON	22K	5%	1/4W	
R775	1-249-435-11	CARBON	33K	5%	1/4W	
R776	1-249-410-11	CARBON	270	5%	1/4W	
R777	1-249-417-11	CARBON	1K	5%	1/4W	
R778	1-249-415-11	CARBON	680	5%	1/4W	
R779	1-249-413-11	CARBON	470	5%	1/4W	
R780	1-249-429-11	CARBON	10K	5%	1/4W	
R781	1-249-422-11	CARBON	2.7K	5%	1/4W	
R801	1-249-417-11	CARBON	1K	5%	1/4W	
R802	1-249-417-11	CARBON	1K	5%	1/4W	
R803	1-249-413-11	CARBON	470	5%	1/4W	
R805	1-249-429-11	CARBON	10K	5%	1/4W	
R806	1-249-427-11	CARBON	6.8K	5%	1/4W	
R807	1-249-417-11	CARBON	1K	5%	1/4W	
R808	1-249-418-11	CARBON	1.2K	5%	1/4W	
R809	1-249-417-11	CARBON	1K	5%	1/4W	
R810	1-249-415-11	CARBON	680	5%	1/4W	
R811	1-249-417-11	CARBON	1K	5%	1/4W	
R812	1-249-423-11	CARBON	3.3K	5%	1/4W	
R813	1-249-416-11	CARBON	820	5%	1/4W	
R814	1-249-415-11	CARBON	680	5%	1/4W	
R815	1-249-429-11	CARBON	10K	5%	1/4W	
R816	1-249-441-11	CARBON	100K	5%	1/4W	
R817	1-249-405-11	CARBON	100	5%	1/4W	
R818	1-249-412-11	CARBON	390	5%	1/4W	
R819	1-249-421-11	CARBON	2.2K	5%	1/4W	
R820	1-249-427-11	CARBON	6.8K	5%	1/4W	
R822	1-249-420-11	CARBON	1.8K	5%	1/4W	
R823	1-249-423-11	CARBON	3.3K	5%	1/4W	
R824	1-249-417-11	CARBON	1K	5%	1/4W	
R825	1-249-422-11	CARBON	2.7K	5%	1/4W	
R826	1-249-427-11	CARBON	6.8K	5%	1/4W	
R827	1-249-424-11	CARBON	3.9K	5%	1/4W	
R828	1-249-410-11	CARBON	270	5%	1/4W	
R831	1-249-429-11	CARBON	10K	5%	1/4W	
R832	1-249-409-11	CARBON	220	5%	1/4W	
R833	1-249-411-11	CARBON	330	5%	1/4W	
R834	1-249-422-11	CARBON	2.7K	5%	1/4W	
R835	1-249-411-11	CARBON	330	5%	1/4W	
R836	1-249-411-11	CARBON	330	5%	1/4W	
R837	1-249-425-11	CARBON	4.7K	5%	1/4W	
R838	1-249-437-11	CARBON	47K	5%	1/4W	
R839	1-249-417-11	CARBON	1K	5%	1/4W	
R846	1-249-425-11	CARBON	4.7K	5%	1/4W	
R847	1-249-421-11	CARBON	2.2K	5%	1/4W	
R848	1-249-421-11	CARBON	2.2K	5%	1/4W	
R849	1-249-429-11	CARBON	10K	5%	1/4W	
R850	1-249-421-11	CARBON	2.2K	5%	1/4W	
R851	1-249-434-11	CARBON	27K	5%	1/4W	
R854	1-247-891-00	CARBON	330K	5%	1/4W	
R855	1-249-411-11	CARBON	330	5%	1/4W	
R856	1-247-887-00	CARBON	220K	5%	1/4W	
R857	1-249-417-11	CARBON	1K	5%	1/4W	
R858	1-249-435-11	CARBON	33K	5%	1/4W	
R862	1-249-423-11	CARBON	3.3K	5%	1/4W	
R863	1-249-430-11	CARBON	12K	5%	1/4W	
R864	1-249-425-11	CARBON	4.7K	5%	1/4W	
R865	1-249-441-11	CARBON	100K	5%	1/4W	
R867	1-249-417-11	CARBON	1K	5%	1/4W	
R868	1-249-421-11	CARBON	2.2K	5%	1/4W	
R869	1-249-433-11	CARBON	22K	5%	1/4W	
R870	1-249-435-11	CARBON	33K	5%	1/4W	
R872	1-249-409-11	CARBON	220	5%	1/4W	
R873	1-247-885-00	CARBON	180K	5%	1/4W	
R874	1-249-429-11	CARBON	10K	5%	1/4W	
R880	1-249-417-11	CARBON	1K	5%	1/4W	
R881	1-249-411-11	CARBON	330	5%	1/4W	
R882	1-249-417-11	CARBON	1K	5%	1/4W	
R883	1-249-419-11	CARBON	1.5K	5%	1/4W	
R884	1-249-436-11	CARBON	39K	5%	1/4W	
R885	1-249-429-11	CARBON	10K	5%	1/4W	
R886	1-249-413-11	CARBON	470	5%	1/4W	
R887	1-249-409-11	CARBON	220	5%	1/4W	
R888	1-249-415-11	CARBON	680	5%	1/4W	
R889	1-249-417-11	CARBON	1K	5%	1/4W	
R890	1-249-417-11	CARBON	1K	5%	1/4W	
R891	1-247-887-00	CARBON	220K	5%	1/4W	
R892	1-249-429-11	CARBON	10K	5%	1/4W	
R893	1-249-417-11	CARBON	1K	5%	1/4W	
R894	1-249-405-11	CARBON	100	5%	1/4W	
R895	1-249-413-11	CARBON	470	5%	1/4W	
R896	1-249-429-11	CARBON	10K	5%	1/4W	
R897	1-249-429-11	CARBON	10K	5%	1/4W	
R898	1-249-429-11	CARBON	10K	5%	1/4W	
R899	1-249-429-11	CARBON	10K	5%	1/4W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
		VARIABLE RESISTOR	
RV701	1-238-015-11	RES, ADJ, CARBON 4.7K (AGC)	
RV702	1-238-015-11	RES, ADJ, CARBON 4.7K (DEV)	
RV703	1-238-017-11	RES, ADJ, CARBON 22K (CARR)	
RV704	1-238-017-11	RES, ADJ, CARBON 22K (DARK CLIP)	
RV705	1-238-017-11	RES, ADJ, CARBON 22K (WHITE CLIP)	
RV707	1-238-012-11	RES, ADJ, CARBON 1K (CCD LEVEL)	
RV708	1-238-016-11	RES, ADJ, CARBON 10K (DEMOD GAIN)	
RV710	1-238-012-11	RES, ADJ, CARBON 1K (REC Y)	
RV801	1-238-012-11	RES, ADJ, CARBON 1K (REC C)	
RV850	1-238-011-11	RES, ADJ, CARBON 470 (SECAM DET)	
RV860	1-238-020-11	RES, ADJ, CARBON 100K (PLAY JOG AFC)	
RV861	1-238-012-11	RES, ADJ, CARBON 1K (0.5H CCD LEVEL)	
		COIL	
T802	1-409-467-11	COIL (TRAP 7.8K)	
T850	1-409-467-11	COIL (TRAP 7.8K)	
		CRYSTAL	
X801	1-577-651-11	VIBRATOR, CRYSTAL (4.433619MHz)	

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*A-6727-189-A RP-100 BOARD, COMPLETE
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*3-746-014-01 CASE (MAIN), GRP
*3-746-015-01 CASE (UPPER), GRP

		CAPACITOR			
C001	1-162-839-11	CERAMIC	0.01MF	10%	16V
C002	1-124-465-00	ELECT	0.47MF	20%	50V
C003	1-124-465-00	ELECT	0.47MF	20%	50V
C004	1-164-031-11	CERAMIC	33PF	5%	50V
C005	1-164-031-11	CERAMIC	33PF	5%	50V
C006	1-124-465-00	ELECT	0.47MF	20%	50V
C007	1-124-465-00	ELECT	0.47MF	20%	50V
C008	1-162-306-11	CERAMIC	0.01MF	20%	16V
C009	1-162-306-11	CERAMIC	0.01MF	20%	16V
C010	1-124-465-00	ELECT	0.47MF	20%	50V
C011	1-124-465-00	ELECT	0.47MF	20%	50V
C012	1-164-027-11	CERAMIC	22PF	5%	50V
C013	1-164-031-11	CERAMIC	33PF	5%	50V
C014	1-124-465-00	ELECT	0.47MF	20%	50V
C015	1-124-465-00	ELECT	0.47MF	20%	50V
C016	1-162-839-11	CERAMIC	0.01MF	10%	16V
C017	1-162-306-11	CERAMIC	0.01MF	20%	16V
C018	1-126-154-11	ELECT	47MF	20%	6.3V
C019	1-162-306-11	CERAMIC	0.01MF	20%	16V
C020	1-126-154-11	ELECT	47MF	20%	6.3V
C021	1-161-375-00	CERAMIC	0.0022MF	20%	16V
C022	1-161-375-00	CERAMIC	0.0022MF	30%	16V
C023	1-162-839-11	CERAMIC	0.01MF	10%	16V

Ref.No	Part No.	Description			Remark
C024	1-124-463-00	ELECT	0.1MF	20%	50V
C025	1-162-839-11	CERAMIC	0.01MF	10%	16V
C026	1-162-306-11	CERAMIC	0.01MF	20%	16V
C027	1-164-027-11	CERAMIC	22PF	5%	50V
C028	1-162-839-11	CERAMIC	0.01MF	10%	16V
C029	1-162-839-11	CERAMIC	0.01MF	10%	16V
C030	1-164-023-11	CERAMIC	15PF	5%	50V
C031	1-162-839-11	CERAMIC	0.01MF	10%	16V
C032	1-164-033-11	CERAMIC	39PF	5%	50V
C033	1-162-839-11	CERAMIC	0.01MF	10%	16V
C034	1-102-973-00	CERAMIC	100PF	5%	50V
C035	1-101-888-00	CERAMIC	68PF	5%	50V
C036	1-102-820-00	CERAMIC	330PF	5%	50V
C037	1-162-839-11	CERAMIC	0.01MF	10%	16V
C038	1-126-154-11	ELECT	47MF	20%	6.3V
C039	1-162-839-11	CERAMIC	0.01MF	10%	16V
C040	1-162-839-11	CERAMIC	0.01MF	10%	16V
C041	1-162-839-11	CERAMIC	0.01MF	10%	16V
C042	1-162-839-11	CERAMIC	0.01MF	10%	16V
		CONNECTOR			
CN001	1-569-709-11	SOCKET, CONNECTOR 8P			
CN002	*1-564-030-00	PIN, CONNECTOR 5P			
CN003	1-506-489-11	PIN, CONNECTOR 10P			
CN004	1-506-489-11	PIN, CONNECTOR 10P			
		DIODE			
D001	8-719-911-19	DIODE 1SS119			
D002	8-719-911-19	DIODE 1SS119			
D003	8-719-911-19	DIODE 1SS119			
		IC			
IC001	8-759-320-52	IC HA118019NT			
		COIL			
L001	1-407-169-XX	INDUCTOR	100UH		
L002	1-407-169-XX	INDUCTOR	100UH		
L003	1-408-975-21	INDUCTOR	27UH		
L004	1-408-973-21	INDUCTOR	18UH		
L005	1-408-977-21	INDUCTOR	39UH		
L006	1-408-970-21	INDUCTOR	10UH		
L007	1-408-973-21	INDUCTOR	18UH		
L008	1-408-985-21	INDUCTOR	180UH		
L009	1-407-169-XX	INDUCTOR	100UH		
		TRANSISTOR			
Q002	8-729-920-68	TRANSISTOR 2SA933S-QR			
Q003	8-729-920-70	TRANSISTOR 2SC1740S-QR			
Q004	8-729-900-89	TRANSISTOR DTC144ES			
Q005	8-729-920-70	TRANSISTOR 2SC1740S-QR			
Q006	8-729-900-89	TRANSISTOR DTC144ES			
Q007	8-729-900-89	TRANSISTOR DTC144ES			

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
		RESISTOR	
R001	1-249-404-00	CARBON 82 5% 1/4W	
R002	1-249-403-11	CARBON 68 5% 1/4W	
R003	1-249-404-00	CARBON 82 5% 1/4W	
R004	1-249-405-11	CARBON 100 5% 1/4W	
R005	1-249-429-11	CARBON 10K 5% 1/4W	
R007	1-249-429-11	CARBON 10K 5% 1/4W	
R008	1-249-429-11	CARBON 10K 5% 1/4W	
R009	1-247-891-00	CARBON 330K 5% 1/4W	
R010	1-249-420-11	CARBON 1.8K 5% 1/4W	
R011	1-247-895-00	CARBON 470K 5% 1/4W	
R012	1-249-433-11	CARBON 22K 5% 1/4W	
R013	1-249-432-11	CARBON 18K 5% 1/4W	
R014	1-249-417-11	CARBON 1K 5% 1/4W	
R016	1-249-417-11	CARBON 1K 5% 1/4W	
R017	1-249-421-11	CARBON 2.2K 5% 1/4W	
R018	1-249-421-11	CARBON 2.2K 5% 1/4W	
R019	1-249-412-11	CARBON 390 5% 1/4W	
R020	1-249-412-11	CARBON 390 5% 1/4W	
R021	1-249-416-11	CARBON 820 5% 1/4W	
R022	1-249-426-11	CARBON 5.6K 5% 1/4W	
R023	1-249-421-11	CARBON 2.2K 5% 1/4W	
R024	1-249-413-11	CARBON 470 5% 1/4W	
R025	1-249-415-11	CARBON 680 5% 1/4W	
R026	1-249-414-11	CARBON 560 5% 1/4W	
R027	1-249-416-11	CARBON 820 5% 1/4W	
R028	1-249-417-11	CARBON 1K 5% 1/4W	
R029	1-249-418-11	CARBON 1.2K 5% 1/4W	
R030	1-249-419-11	CARBON 1.5K 5% 1/4W	
R031	1-249-421-11	CARBON 2.2K 5% 1/4W	
R032	1-249-417-11	CARBON 1K 5% 1/4W	
R033	1-249-429-11	CARBON 10K 5% 1/4W	

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*A-6754-052-A MF-95 BOARD, COMPLETE
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Ref.No	Part No.	Description	Remark
		CAPACITOR	
C061	1-164-075-11	CERAMIC 150PF 10% 50V	
C062	1-164-075-11	CERAMIC 150PF 10% 50V	
C063	1-164-159-11	CERAMIC 0.1MF 50V	
C099	1-162-851-11	CERAMIC 0.1MF 10% 16V	
		CONNECTOR	
CN060	1-568-667-11	CONNECTOR, BOARD TO BOARD 14P	
		JACK	
CNJ061	1-569-444-11	JACK, PIN 2P (AUDIO/VIDEO)	
		DIODE	
D061	8-719-940-82	DIODE SLR-34MC3	
D062	8-719-940-82	DIODE SLR-34MC3	
D063	8-719-110-36	DIODE RD13ES-B2	
D064	8-719-110-36	DIODE RD13ES-B2	
D065	8-719-110-36	DIODE RD13ES-B2	
D066	8-719-940-99	DIODE SLR-34VC3 (SLV-373UB)	
D067	8-719-940-99	DIODE SLR-34VC3 (SLV-373UB)	
		IC	
IC061	1-466-131-11	CATCHER RAY BLOCK GP1U52X	
		COIL	
L061	1-408-425-00	INDUCTOR 220UH	
		TRANSISTOR	
Q061	8-729-900-61	TRANSISTOR DTA114ES (SLV-373UB)	
		RESISTOR	
R061	1-249-437-11	CARBON 47K 5% 1/4W	
R062	1-249-423-11	CARBON 3.3K 5% 1/4W	
R063	1-249-407-11	CARBON 150 5% 1/4W	
R064	1-249-407-11	CARBON 150 5% 1/4W	
R065	1-249-427-11	CARBON 6.8K 5% 1/4W	
R066	1-247-848-11	CARBON 5.1K 5% 1/4W	
R067	1-249-404-00	CARBON 82 5% 1/4W	
R068	1-249-422-11	CARBON 2.7K 5% 1/4W	
R069	1-249-427-11	CARBON 6.8K 5% 1/4W	
R070	1-249-417-11	CARBON 1K 5% 1/4W	
R071	1-249-409-11	CARBON 220 5% 1/4W (SLV-373UB)	
R072	1-249-409-11	CARBON 220 5% 1/4W (SLV-373UB)	
R099	1-249-401-11	CARBON 47 5% 1/4W	
		VARIABLE RESISTOR	
RV061	1-230-819-11	RES, VAR, CARBON 2K (SHARPNESS)	
		SWITCH	
S061	1-571-977-11	SWITCH, TACTIL (POWER)	
S062	1-571-977-11	SWITCH, TACTIL (EJECT)	
S063	1-570-854-11	SWITCH, SLIDE (VTR MODE)	
S065	1-571-977-11	SWITCH, TACTIL (VPS) (SLV-373VP)	

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*1-635-173-11 MF-96 BOARD
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Ref.No	Part No.	Description	Remark
		CONNECTOR	
CN080	1-569-336-11	CONNECTOR, BOARD TO BOARD 7P	
		SWITCH	
S081	1-466-302-11	SWITCH, ROTARY	

When indicating parts by reference number, please include the board name.

MD-40

Ref.No	Part No.	Description			Remark
	*A-6754-055-A	MD-40 BOARD, COMPLETE **********************			
	*3-736-144-01	HOLDER, LED			
	3-736-149-01	HOLDER, ST SENSOR			
		CAPACITOR			
C001	1-161-494-00	CERAMIC	0.022MF		25V
C002	1-161-494-00	CERAMIC	0.022MF		25V
C003	1-124-240-71	ELECT	10MF	20%	25V
C004	1-161-379-00	CERAMIC	0.01MF	30%	16V
C005	1-124-240-71	ELECT	10MF	20%	25V
C006	1-126-154-11	ELECT	47MF	20%	6.3V
C008	1-164-159-11	CERAMIC	0.1MF		50V
C009	1-164-159-11	CERAMIC	0.1MF		50V
C013	1-164-159-11	CERAMIC	0.1MF		50V
C014	1-164-159-11	CERAMIC	0.1MF		50V
C015	1-164-159-11	CERAMIC	0.1MF		50V
C016	1-124-240-71	ELECT	10MF	20%	25V
C017	1-124-240-71	ELECT	10MF	20%	25V
C018	1-124-240-71	ELECT	10MF	20%	25V
C019	1-162-852-11	CERAMIC	0.15MF	10%	16V
C020	1-162-851-11	CERAMIC	0.1MF	10%	16V
C025	1-124-240-71	ELECT	10MF	20%	25V
C026	1-124-240-71	ELECT	10MF	20%	25V
C027	1-124-240-71	ELECT	10MF	20%	25V
		CONNECTOR			
CN001	*1-564-201-11	PIN HEADER, ANGLE 10P			
CN002	1-569-335-11	CONNECTOR, BOARD TO BOARD 9P			
CN003	1-569-334-11	CONNECTOR, BOARD TO BOARD 5P			
CN004	1-569-341-11	CONNECTOR, BOARD TO BOARD 19P			
CN005	1-506-468-11	PIN, CONNECTOR 3P			
CN006	1-569-333-11	CONNECTOR, BOARD TO BOARD 3P			
CN007	1-569-341-11	CONNECTOR, BOARD TO BOARD 19P			
		DIODE			
D001	8-719-974-65	DIODE GL451V (LED)			
D002	8-719-109-97	DIODE RD6.8ES-B2			
D003	8-719-109-97	DIODE RD6.8ES-B2			
		IC			
IC002	8-759-938-12	IC BA10324			
IC004	⚠.8-759-420-83	IC AN3814K			
IC005	8-759-008-72	IC LM393N			
		PHOTO SENSOR			
PH001	8-759-144-33	PHOTO SENSOR PS6002			
PH002	8-759-144-33	PHOTO SENSOR PS6002			
		TRANSISTOR			
Q001	8-729-921-53	PHOTO TRANSISTOR PT483F1			
Q002	8-729-921-53	PHOTO TRANSISTOR PT483F1			

Ref.No	Part No.	Description				Remark
		RESISTOR				
R001	1-249-423-11	CARBON	3.3K	5%	1/4W	
R002	1-249-423-11	CARBON	3.3K	5%	1/4W	
R003	1-249-426-11	CARBON	5.6K	5%	1/4W	
R004	1-249-426-11	CARBON	5.6K	5%	1/4W	
R005	1-249-420-11	CARBON	1.8K	5%	1/4W	
R006	1-249-441-11	CARBON	100K	5%	1/4W	
R007	1-249-441-11	CARBON	100K	5%	1/4W	
R008	1-249-425-11	CARBON	4.7K	5%	1/4W	
R009	1-249-409-11	CARBON	220	5%	1/4W	
R010	1-249-425-11	CARBON	4.7K	5%	1/4W	
R011	1-249-437-11	CARBON	47K	5%	1/4W	
R012	1-249-421-11	CARBON	2.2K	5%	1/4W	
R013	1-249-429-11	CARBON	10K	5%	1/4W	
R014	1-249-427-11	CARBON	6.8K	5%	1/4W	
R015	1-249-437-11	CARBON	47K	5%	1/4W	
R016	1-249-421-11	CARBON	2.2K	5%	1/4W	
R022	1-249-430-11	CARBON	12K	5%	1/4W	
R023	1-249-429-11	CARBON	10K	5%	1/4W	
R024	1-249-430-11	CARBON	12K	5%	1/4W	
R025	1-249-429-11	CARBON	10K	5%	1/4W	
R026	1-249-437-11	CARBON	47K	5%	1/4W	
R028	1-249-418-11	CARBON	1.2K	5%	1/4W	
R029	1-249-395-11	CARBON	15	5%	1/4W	
R030	1-249-395-11	CARBON	15	5%	1/4W	
R031	1-249-395-11	CARBON	15	5%	1/4W	
R032	⚠.1-216-347-11	METAL OXIDE	0.68	5%	1W	F
		SWITCH				
S001	1-570-953-11	SWITCH, PUSH (1 KEY)				
S002	1-570-953-11	SWITCH, PUSH (1 KEY)				

****

MISCELLANEOUS
****

Ref.No	Part No.	Description
	A-6761-129-A	HEAD BLOCK ASSY, ACE
	⚠.1-413-535-11	BLOCK, POWER (SLV-373UB)
	⚠.1-413-537-11	BLOCK, POWER (SLV-373VP)
	⚠.1-413-538-11	BLOCK, POWER (SLV-373)
	1-466-315-31	SWITCH BLOCK, CONTROL (SLV-373VP)
	1-543-647-11	HEAD, FE
	1-550-573-11	DRUM ASSY (DZR-22R)
	1-550-574-11	DRUM ASSY (DZL-22A-R)
CN001	1-506-482-11	PIN, CONNECTOR 3P
M903	X-3733-302-1	MOTOR ASSY, CAM
M904	X-3727-784-1	MOTOR ASSY (LOADING)
S001	1-571-920-11	SWITCH, ROTARY

****

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

ACCESSORIES AND PACKING MATERIALS

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Part No.	Description	Remark
1-465-514-11	COMMANDER, REMOTE (RMT-V373)	
1-551-513-00	CORD ASSY, COAXIAL	
⚠.1-558-032-11	CORD, POWER (SLV-373UB)	
⚠.1-575-131-11	CORD, POWER (SLV-373)	
⚠.1-575-132-11	CORD, POWER (SLV-373VP)	
3-695-308-01	DRIVER, VOLUME	
*3-744-232-01	CUSHION (UPPER)	
*3-744-233-01	CUSHION (LOWER)	
*3-746-027-21	INDIVIDUAL CARTON	
3-751-655-11	MANUAL, INSTRUCTION (ENGLISH)(SLV-373UB)	
3-751-655-41	MANUAL, INSTRUCTION (SLV-373VP) (FRENCH/GERMAN/DUTCH/ITALIAN)	
3-751-655-51	MANUAL, INSTRUCTION (SLV-373) (SWEDISH SPANISH PORTUGUESE/ITALIAN)	
*3-751-893-41	CARD, CONTROL INSTANT	

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HARDWARE LIST

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SET-SCT

7-621-732-08	SET-SCT, HEX. 2X3 FLAT POINT

STOP RING

7-624-102-04	STOP RING 1.5, TYPE -E

SCREW

7-627-552-08	SCREW, PRECISION +P 1.7X2.5
7-628-254-00	SCREW +PS 2.6X5
7-682-547-04	SCREW +P 3X6
7-682-548-04	SCREW +P 3X8
7-682-645-01	SCREW +PS 3X4
7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3
7-685-647-79	SCREW +BVTP 3X10 TYPE2 IT-3
7-685-648-79	SCREW +BVTP 3X12 TYPE2 IT-3

****

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

SECTION 7
MECHANICAL ADJUSTMENTS

Refer to "VHS MECHANICAL ADJUSTMENT MANUAL Ⅱ " separately issued for MECHANICAL ADJUSTMENTS.

PERIODIC CHECK AND REPLACEMENT

In order to obtain the best performance from this unit and make full use of its capabilities, and to extend the life of the unit and tapes, it is recommended that the following periodic checks and maintenance be performed.

* The following must be done after every repair regardless of how many hours the user has operated the machine.

CLEANING OF ROTATING HEAD DISK ASSEMBLY

1) Press a chamois cloth (Jig Ref. No. J-7) which has been dipped in cleaning fluid (Jig Ref. No. J-5) lightly against the rotating drum assembly, then do the cleaning by slowly rotating the rotating head disk by hand. (Never try to clean by using the motor to turn it.)
2) Never try to clean by moving the chamois cloth at a vertical angle to the head tip. There is a very great danger of damaging the head tip if this is doen.

CLEANING OF THE TAPE MOVEMENT SYSTEM

1) Clean the surfaces which the tape contacts during its movement (tape guide, drum assembly surface, capstan, pinch roller, etc.) with a chamois cloth that has been dipped in cleaning fluid.

CLEANING THE DRIVE SYSTEM

1) Clean the driving parts with a cloth that has been dipped in cleaning fluid.

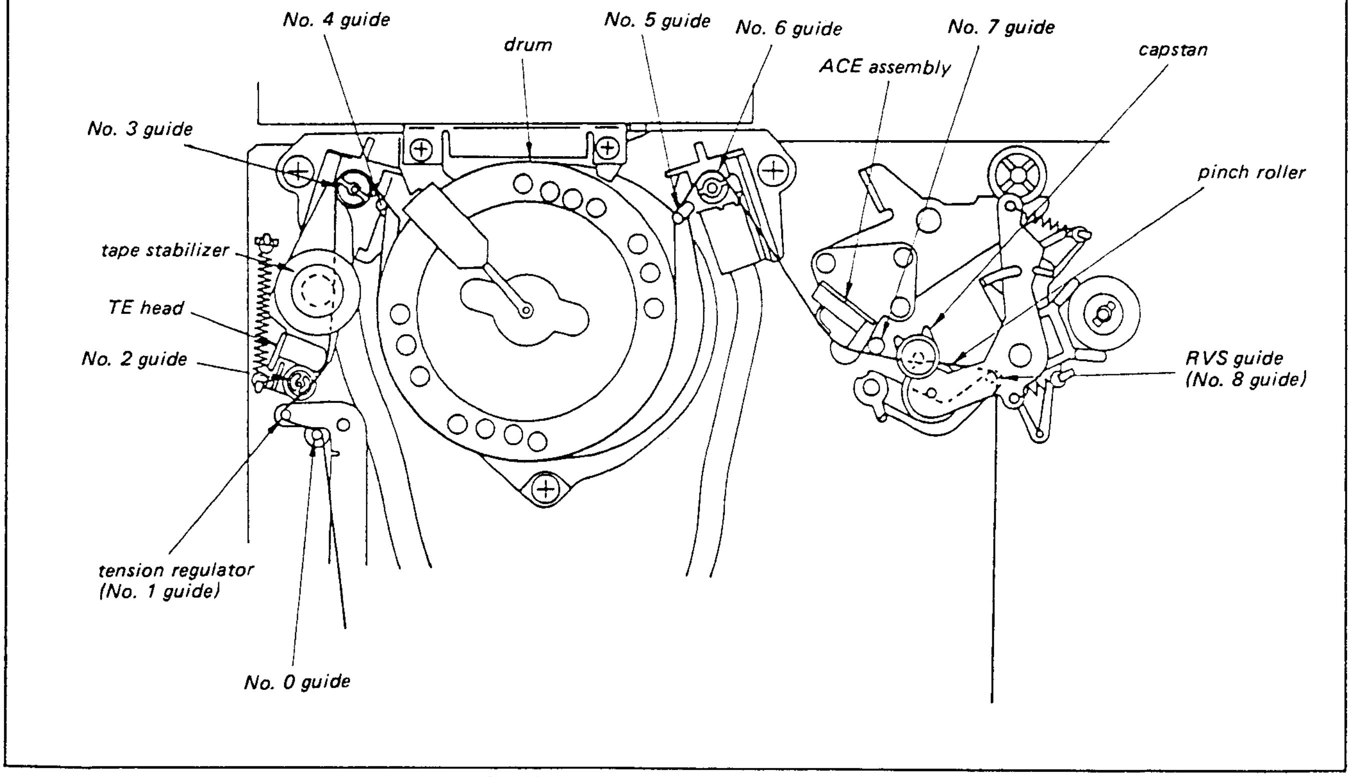
No. 4 guide
drum
No. 5 guide
No. 6 guide
No. 7 guide
ACE assembly
capstan
No. 3 guide
pinch roller
tape stabilizer
TE head
No. 2 guide
RVS guide
(No. 8 guide)
tension regulator
(No. 1 guide)
No. 0 guide

Fig. 1. Parts requiring cleaning

PERIODIC CHECK ITEMS

Perform the maintenance and check listed on the table below, according to users operating hours.

			Operating Hours (H)										
	Maintenance & Check	Replacement Part No.	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	Remarks
Tape Transportation System	Cleaning of tape transportation system		○	○	○	○	○	○	○	○	○	○	This cleaning must be done whenever a repair is made.
	Cleaning and degaussing of ACE ass'y	A-6761-129-A	○	○	○	○	○	○	○	○	○	○	
	Cleaning & degaussing of video disk ass'y		○	○	○	○	○	○	○	○	○	○	The life of the head varies, depending on operational conditions and method.
Driving System	Timing belt	3-736-013-01	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	This cleaning must be done whenever a repair is made.
Performance Confirmation	Abnormal sound		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust or replace the section which causes abnormal sound.
	Measurement of FWD back tension		-	☆	-	☆	-	☆	-	☆	-	☆	Confirmation must be made according to "VHS MECHANICAL ADJUSTMENT MANUAL II" item 4-1-1. Specified value: adjust to 30 to 42 g·cm (when measured with torque cassette tape)
	Confirmation of brake system		-	☆	-	☆	-	☆	-	☆	-	☆	Confirmation must be made according to section
	Confirmation of record & playback functions		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Perform the confirmation whenever repair is made.
	Measurement of forward torque		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust to 80-170 g·cm

○ Cleaning ☆ Confirmation

Note: On overhaul
When overhauling the unit, replace parts as indicated in the above table.